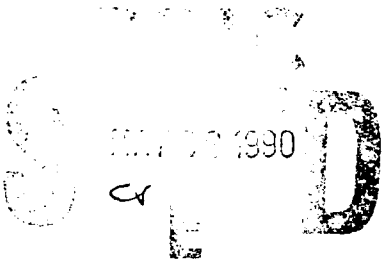
Research Product 90-10a

Task Analysis of the CH–47D Mission and Decision Rules for Developing a CH–47D Workload Prediction Model

Volume I: Summary Report

Carl R. Bierbaum and Theodore B. Aldrich
Anacapa Sciences, Inc.



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A mission scenario was used to conduct a comprehensive task analysis for CH-47D operations. The analysis used a top-down approach to identify the phases, functions, and tasks for the mission. Nine phases, 37 segments, 66 functions, and 154 tasks were identified. The crewmember performing each task was identified and estimates of the sensory, cognitive, and psychomotor workload associated with the tasks were derived. Estimates of the task times also were derived.

The mission/task/workload analysis data were used to develop a computer model of workload for CH-47D crewmembers. The model used a bottom-up approach to build mission functions from tasks and mission segments from functions. Decisions rules were written to specify the procedure for combining the tasks into functions and the functions into segments. The model permitted an analysis of total workload experienced by each crewmember in the performance of both sequential and concurrent tasks.

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EDGAR M. JOHNSON
Technical Director

JON W. BLADES
COL, IN
Commanding

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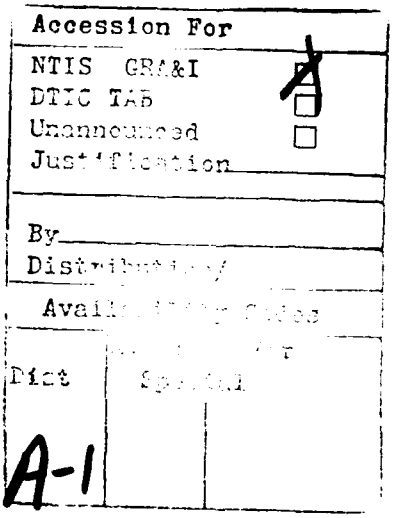
Anacapa Sciences, Inc.

Technical review by

Charles A. Gainer
Gabriel P. Intano
Thomas R. Metzler
Raymond C. Sidorsky
Paul J. Tremont



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Volume I: Summary Report

Carl L. Bierbaum and Theodore B. Aldrich
Anacapa Sciences, Inc.

Aviation R & D Activity at Fort Rucker, Alabama
Charles A. Gainer, Chief

Systems Research Laboratory
Robin L. Keesee, Director

U.S. Army Research Institute for the Behavioral and Social Sciences
5001 Eisenhower Avenue, Alexandria, Virginia 22333-5600

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Human Factors in Training and Operational Effectiveness

FOREWORD

The Army Research Institute Aviation Research and Development Activity (ARIARDA) at Fort Rucker, Alabama, is an operational unit of the Training Research Laboratory and provides research support in aircrew training to the U.S. Army Aviation Center (USAAVNC). Research is conducted inhouse and is augmented by onsite contract support. This report documents contract work performed by ARIARDA in support of the Special Operations Aircraft (SOA) Program Manager (PM) Office at the Army Aviation Systems Command (AVSCOM).

The potential impact that advanced technology will have on manpower and personnel requirements must be considered during the early stages of planning for system modifications. One critical consideration is the impact that advanced technology will have on the workload of the system operator(s). Since operator overload can result in a dramatic decrease in system effectiveness, it is imperative that operator workload be considered throughout the system modification process.

This report describes the methods used to conduct a comprehensive task analysis of the CH-47D mission. Information provided by the CH-47D mission/task/workload analysis was used to establish a database for developing a computer model that predicts workload for the CH-47D pilot and copilot. Assessments of workload produced by the model provide a baseline for evaluating the workload impact of any high technology modifications or product improvements.

The report consists of two volumes. Volume I describes the methods for conducting the research and contains Appendixes A through E. Volume II contains function and segment summary worksheets and decision rules, Appendixes F through I.

Appendixes A through E, presented in Volume I, summarize the results of the CH-47D baseline mission/task/workload analysis. The following specific information is presented in each of these appendixes:

- Appendix A summarizes the segments in each mission phase;
- Appendix B presents an alphabetical list of the unique mission functions;
- Appendix C summarizes the functions in each mission segment;
- Appendix D presents an alphabetical list of the unique tasks; and

- Appendix E presents Function Analysis Worksheets that summarize the workload data derived for each unique function.

The information presented in Volume I comprises a comprehensive task database for developing the CH-47D workload prediction model.

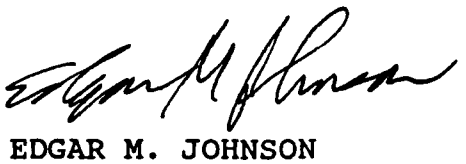
Volume II of the report contains Appendixes F through I. The following information is presented in each of the appendixes:

- Appendix F presents the Function Summary Worksheets,
- Appendix G presents the Function Decision Rules,
- Appendix H presents the Segment Summary Worksheets, and
- Appendix I presents the Segment Decision Rules.

The Function Decision Rules provide directions for building functions from the tasks identified in the analysis and the Segment Decision Rules provide directions for building mission segments from the functions.

Comments or questions about the research should be directed to Mr. Charles A. Gainer at the following address:

Chief
ARI Aviation Research and Development Activity
ATTN: PERI-IR (Mr. Charles A. Gainer)
Fort Rucker, Alabama 36362-5354



EDGAR M. JOHNSON
Technical Director

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Chief Warrant Officer, W4 Marty L. Anderson, Flight Standardization Division, Directorate of Evaluation and Standardization, and Chief Warrant Officer, W4 Ronald E. Newsome, Cargo Utility Systems Branch, Aviation Division, Department of Gunnery and Flight Systems, served as subject matter experts (SMEs) for the review of the mission task analysis. The baseline task analysis required in-depth knowledge of the cockpit configuration for both crewmembers of the CH-47D aircraft. The SMEs' knowledge of the specific tasks performed by the pilot and copilot in the conduct of their mission contributed greatly to the success of the task analysis. Ms. Cassandra Hocutt, Anacapa Sciences, Inc., spent many hours developing the task analysis/workload (TAWL) software system to provide for easy entering and management of the mission/task/workload database and the CH-47D workload prediction model. The authors especially thank Ms. Nadine McCollim for the speed and accuracy in typing the numerous revisions of the task analysis. Her work significantly enhanced the quality of the final product.

TASK ANALYSIS OF THE CH-47D MISSION AND DECISION RULES FOR DEVELOPING A CH-47D WORKLOAD PREDICTION MODEL. VOLUME I: SUMMARY REPORT

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AA	-	Assembly Area
ARIARDA	-	Army Research Institute Aviation Research and Development Activity
ARTEP	-	Army Training and Evaluation Program
AVSCOM	-	Army Aviation Systems Command
FARP	-	Forward Area Arming and Refueling Point
LHX	-	Light Helicopter Family
LZ	-	Landing Zone
NOE	-	Nap-of-the-Earth
NVG	-	Night Vision Goggles
PZ	-	Pick-up Zone
SME	-	Subject Matter Expert
SOF	-	Special Operations Forces
TAWL	-	Task Analysis/Workload

TASK ANALYSIS OF THE CH-47D MISSION AND DECISION RULES FOR DEVELOPING A CH-47D WORKLOAD PREDICTION MODEL

VOLUME I: SUMMARY REPORT

INTRODUCTION

Advanced technology currently being proposed for the next generation of Army helicopters is designed to reduce the heavy workload operators are likely to encounter in the high-threat environment of the Air/Land Battle 2000 scenario. However, in some instances, technological improvements may result in greater crewmember monitoring and decision-makirg responsibilities. Excessive demands on mental resources may degrade the quality of crewmembers' performance. Since the operator's performance is critical to mission effectiveness, it is essential that operator workload be considered throughout the system design process (Shingledecker & Crabtree, 1982).

One reason that system designers have failed to consider operator workload when proposing advanced technology for new Army aircraft is that there has been no methodology for estimating operator workload prior to and during the system development process. However, Anacapa Sciences, Inc. researchers, under contract to the U.S. Army Research Institute Aviation Research and Development Activity (ARIARDA), developed a methodology for predicting operator workload during the conceptual phase of the system development process for the Army's Light Helicopter Family (LHX) aircraft (Aldrich, Craddock, & McCracken, 1984; Aldrich, Szabo, & Craddock, 1986; McCracken & Aldrich, 1984). The methodology was used to generate workload predictions for one- and two-crewmember configurations during LHX system trade-off studies and analyses.

The LHX methodology employs a generic workload prediction model that can be tailored for use in making critical design decisions about any emerging weapon system. For example, the LHX methodology has been refined and used to develop baseline models for predicting workload encountered by the operators of the AH-64A aircraft (Szabo & Bierbaum, 1986) and UH-60A aircraft (Bierbaum, Szabo, & Aldrich, 1987). In contrast to the LHX model, which is based on an analysis of a proposed system, the AH-64A and UH-60A baseline models are based on existing aircraft. Consequently, the AH-64A and UH-60A workload analyses were conducted at a high level of task specificity.

One of the features of the workload prediction methodology is that it can be used to predict the effect that (a) proposed modifications have to an aircraft and (b) alternative crew complements may have on operator workload. For example, Aldrich, Szabo, and Craddock (1986) report predictions of operator workload for 42 different configurations of automation options proposed for both a one- and two-crewmember LHX design. The AH-64A workload prediction model was exercised to predict the effect on operator workload for a proposed Airborne Target Handover System modification to the AH-64A (Szabo, Bierbaum, & Aldrich, 1987).

Recently the Special Operations Forces (SOF) Program Management Office at the Army Aviation Systems Command (AVSCOM) was tasked to modify the UH-60A and CH-47D aircraft with new technology for SOF missions. The aircraft, designated the MH-60K and the MH-47E, respectively, will be modified by replacing present instrumentation with fully integrated cockpits featuring four multifunction displays. The SOF Program Manager requested that the ARIARDA's AVSCOM Element support the development of the MH-60K and MH-47E aircraft. Accordingly, ARIARDA tasked Anacapa Sciences to apply the workload prediction methodology in support of the SOF modifications.

This report presents the results of a comprehensive task analysis of the CH-47D mission and the development of a baseline workload prediction model for estimating operator workload for the current CH-47D aircraft. Subsequently, a comprehensive task analysis of the SOF mission, as performed in the MH-47E aircraft, will be performed and an MH-47E workload prediction model will be developed. The baseline CH-47D workload prediction model will be exercised to produce estimates of workload experienced by operators in the performance of their current mission. The MH-47E model will be exercised to produce predictions of crew workload during performance of the SOF mission. Workload predictions yielded by the CH-47D workload prediction model will be compared with workload predictions yielded by the MH-47E workload prediction model. The MH-47E workload prediction model also will be exercised for various advanced technology configurations proposed for the MH-47E aircraft. Workload predictions for the various configurations will be compared to identify the optimum advanced technology configuration for reducing operator workload.

Objectives

The research described in this report has three general objectives:

- conduct a detailed analysis of the tasks that must be performed to accomplish the CH-47D combat mission;
- estimate the workload associated with the performance of the CH-47D mission tasks; and
- develop a computer model to predict CH-47D operator workload.

To accomplish the general objectives, the following specific objectives were established:

- identify the phases, segments, functions, and tasks required to perform the CH-47D combat mission;
- identify the crewmember(s) performing each task;
- estimate the workload associated with the sensory, cognitive, and psychomotor components of each task;
- define the temporal sequence of the tasks and estimate the duration of each task;
- identify the subsystem(s) representing the man-machine interface for each task;
- develop decision rules for combining the tasks to form each mission function; and
- develop decision rules for combining the functions to form each mission segment.

The research tasks that were performed to meet these objectives are described in the sections that follow.

METHOD

Conduct of the Mission/Task/Workload Analysis

This section describes the research steps that were performed to conduct the mission/task/workload analysis for the existing CH-47D aircraft. The analysis addressed the mission tasks and concomitant workload for both the pilot and copilot. The CH-47D crew also requires a flight engineer, but the analysis does not include the flight engineer functions and tasks. The research steps are listed below in the order in which they were performed:

- develop a composite mission scenario,
- divide the composite mission scenario into mission phases,
- divide the mission phases into mission segments,
- identify the mission functions in each mission segment,
- identify the crewmember tasks in each unique mission function,
- identify the crewmember(s) performing each task,
- identify the subsystem(s) representing the man-machine interface for each crewmember task,
- estimate the workload associated with the sensory, cognitive, and psychomotor components of each crewmember task, and
- define the temporal sequence and estimate the duration of each task.

A task-flow diagram depicting these research tasks is presented in Figure 1. Each of the research tasks is described in detail in succeeding paragraphs of this report; products resulting from the performance of the research tasks are presented in the appendixes to the report.

Develop a Mission Scenario

The first step in conducting the CH-47D mission/task/workload analysis was to develop a mission scenario for the CH-47D. The scenario was developed from information derived from three primary sources: (a) review of the CH-47D Operator's Manual (Department of the Army, 1982), (b) review of the Army Training and Evaluation Program (ARTEP) Manual for Transportation Helicopter Battalion (Department of the Army, 1983), and (c) interviews with CH-47D subject-matter

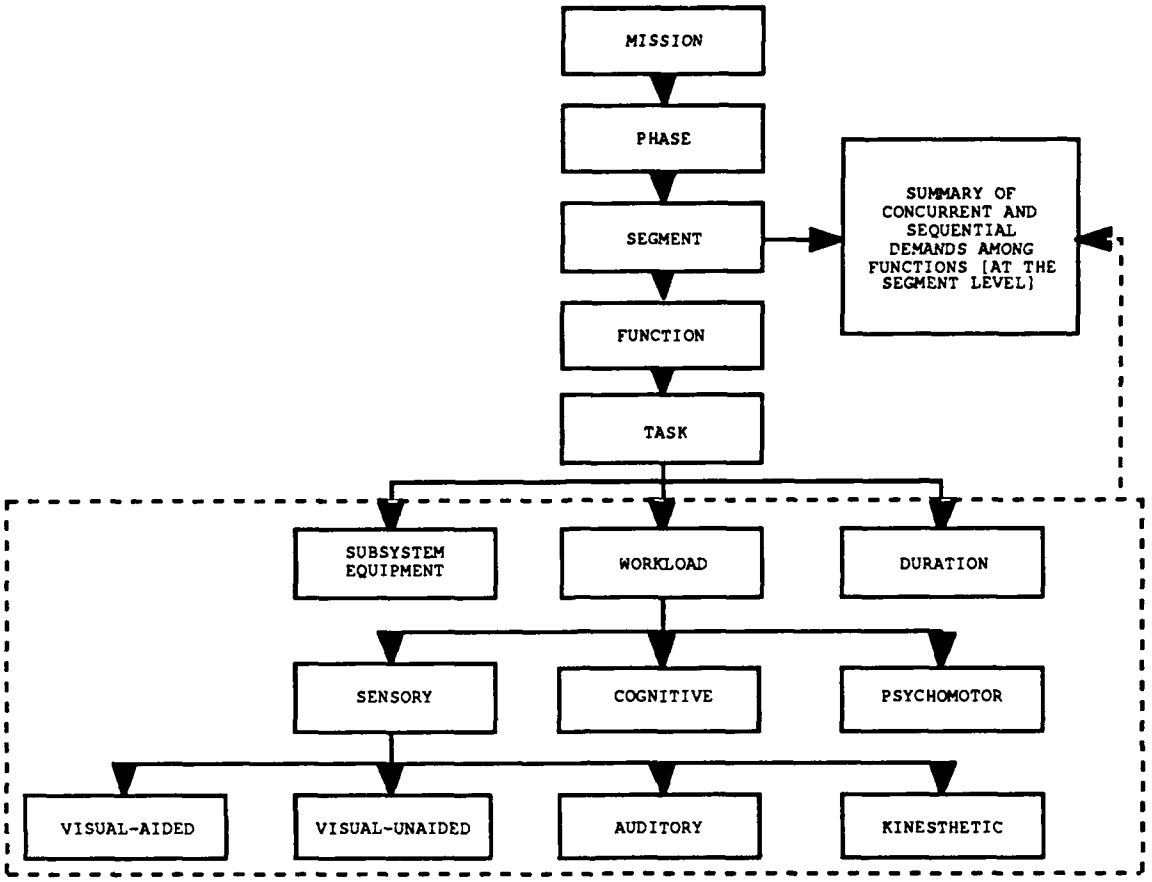

Figure 1. Task-flow diagram of the "top-down" approach used to conduct the CH-47D mission/task/workload analysis.

experts (SMEs). The scenario that was developed from these sources is graphically depicted in Figure 2. A fundamental assumption underlying this scenario is that the basic mission for the CH-47D aircraft is to provide air transportation of personnel and cargo in support of combat operations. The scenario further assumes that the CH-47D combat support operations can be conducted under either day or night conditions and may include the transportation of both internal loads and external sling loads.

As shown in Figure 1, the CH-47D mission begins in an assembly area (AA) where preflight and departure operations are performed. The pilot then flies contour flight from the AA to a pick-up zone (PZ), where cargo and/or troops are assembled for pick-up. After completing the loading operations, the pilot flies nap-of-the-earth (NOE) to the landing zone (LZ) to insert the combat troops or deliver the cargo.

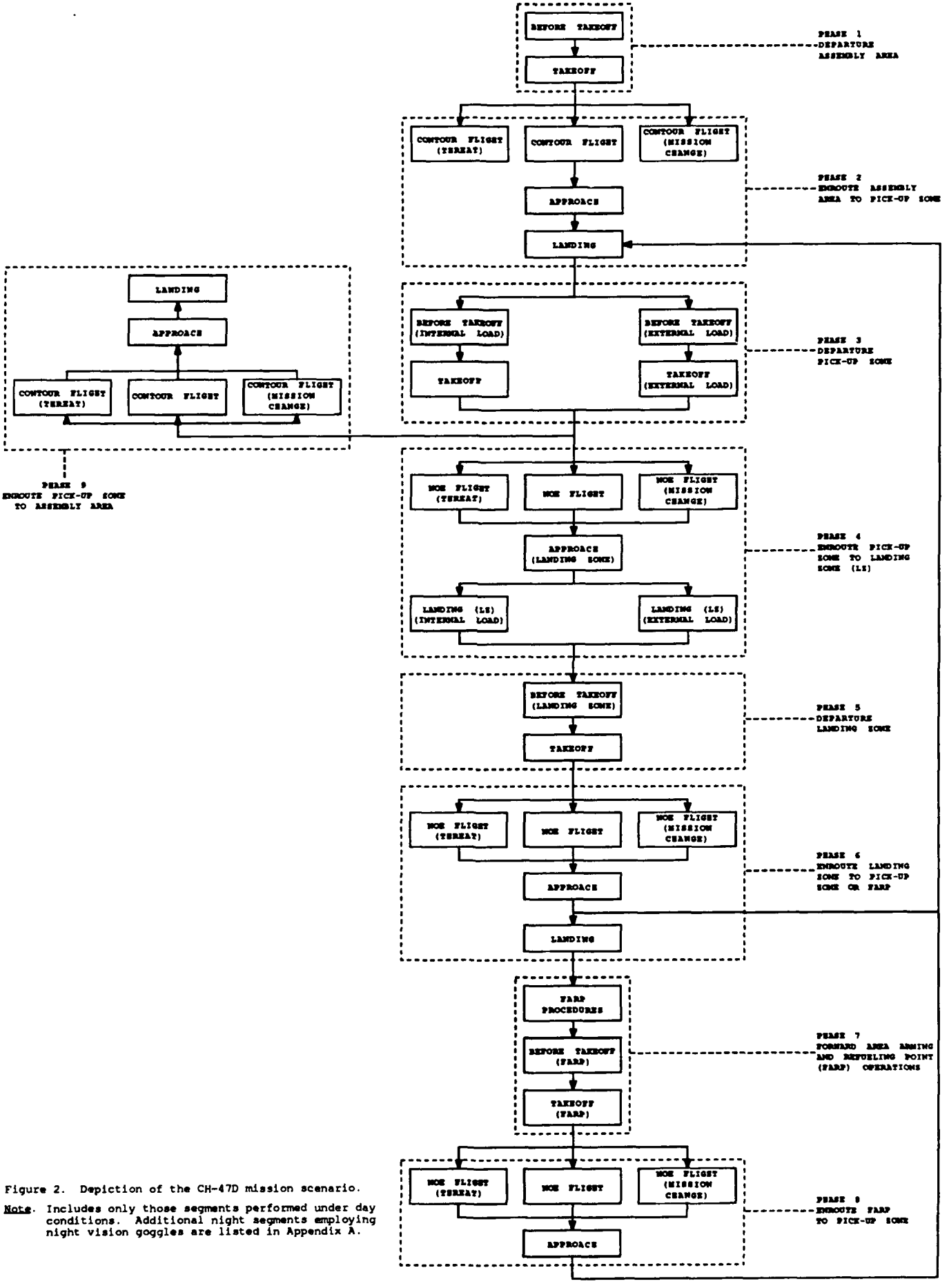

Figure 2. Depiction of the CH-47D mission scenario.

Note. Includes only those segments performed under day conditions. Additional night segments employing night vision goggles are listed in Appendix A.

After completing the troop and/or cargo delivery, the pilot flies NOE back to the PZ for another load. This pattern of activity is continued until the aircraft requires refueling. The pilot then flies NOE from the LZ to the forward area arming and refueling point (FARP), where refueling operations are conducted. Upon completion of the FARP operations, the crew returns to the PZ for continuation of the mission. When the mission is complete, the pilot flies contour back to the AA where postflight activities are conducted. It is assumed that, during the conduct of these mission operations, the pilot's primary role is to fly the aircraft, while the copilot's primary role is to assist the pilot and perform navigation functions; furthermore, it is assumed that the mission is flown under optimal performance conditions (i.e., daylight or full moon at night with no degradations due to weather or emergencies).

While the authors are aware that the activities and conditions encountered on any given mission may differ from those described above, the adoption of a mission scenario encompassing a standard set of assumptions is an essential step in conducting the mission analysis. First, the scenario provides a basis for conducting a comprehensive analysis of all possible mission segments. Second, the scenario provides a standard against which the effect of proposed changes in the mission and/or the aircraft configuration can be compared. Finally, by assuming optimal conditions for performance of the mission, the most conservative estimates of workload are produced. If excessive workload is predicted to occur during optimal conditions, almost certainly excessive workload will occur during degraded conditions.

Divide the Mission Scenario Into Mission Phases

The mission scenario described above was subsequently divided into nine mission phases. At the request of AVSCOM, preflight and postflight operations were excluded from the analysis; consequently, the research begins with departure from the assembly area and ends with return to the assembly area. The nine phases included in the analysis are listed below in the order of their occurrence within the mission; the phases are also shown in Figure 2.

- Phase 1: Departure (AA),
- Phase 2: Enroute (AA-PZ),
- Phase 3: Departure (PZ),
- Phase 4: Enroute (PZ-LZ),
- Phase 5: Departure (LZ),
- Phase 6: Enroute (LZ-PZ) or (LZ-FARP),
- Phase 7: FARP Operations,

- Phase 8: Enroute (FARP-PZ), and
- Phase 9: Enroute (PZ-AA).

Divide the Mission Phases Into Segments

The nine mission phases selected for analysis were subsequently divided into mission segments. A mission segment is defined as a major sequence of events that has a definite start and end point during a mission phase. An example of a segment performed during the Departure (Assembly Area) phase of the CH-47D mission is Before Takeoff (Assembly Area).

A total of 71 segments were identified for the nine mission phases selected for analysis. Thirty-seven segments are unique (i.e., segments that are distinctly different from any other segment); the remaining 34 segments are duplicates of the 37 unique segments. The total number of segments identified in each of the nine mission phases is presented below.[1]

- Phase 1: Departure (AA) - 4 segments,
- Phase 2: Enroute (AA-PZ) - 10 segments,
- Phase 3: Departure (PZ) - 7 segments,
- Phase 4: Enroute (PZ-LZ) - 12 segments,
- Phase 5: Departure (LZ) - 3 segments,
- Phase 6: Enroute (LZ-PZ) or (LZ-FARP) - 10 segments,
- Phase 7: FARP Operations - 5 segments,
- Phase 8: Enroute (FARP-PZ) - 10 segments, and
- Phase 9: Enroute (PZ-AA) - 10 segments.

The specific mission segments that must be performed to accomplish each of the nine mission phases under day and night conditions are listed in Appendix A.[2] The two-digit number assigned to each segment in Appendix A is based on the ordinal position of the segment within the mission scenario described above. Segments occurring more than once during the mission are identified by the ordinal position of their initial occurrence, and thus, retain the same numerical identifier throughout the scenario.

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[1] The reported total for each mission phase includes all the segments that are performed during both day and night conditions for that phase--not just the number of unique segments in that phase.

[2] As previously noted, the segments listed for each phase in Figure 2 include only those segments performed under day conditions. Additional segments identified in Appendix A for each mission phase are those segments that are performed with night vision goggles.

Identify the Functions in the Mission Segments

Each of the 37 unique mission segments was further divided into functions. A function is defined as a set of activities that must be performed either by an operator or by equipment in order to complete a portion of the mission segment. An example of a mission function performed during the previously presented segment, Before Takeoff (Assembly Area), is Perform Hover.

A total of 66 unique functions were identified for the 37 mission segments. The unique functions were ordered in an alphabetical list, and a number (1-66) was assigned corresponding to the ordinal position of each function within the list. The number assigned serves as an identifier for the function within the computer model data base.

The alphabetical list of functions and their respective numerical identifiers are presented in Appendix B. A list of the functions that must be performed to accomplish each of the 71 mission segments is presented in Appendix C.

Identify the Tasks for Each Unique Function

Each of the 66 unique functions was further divided into tasks. Each task defines a specific crew activity that is essential to the successful performance of the selected function. The task description consists of a verb and an object; the verb describes the action by the crewmember, and the object describes the recipient of the action. Examples of tasks performed during the function, Perform Hover, include Check Obstacle Clearance, Control Altitude, and Control Drift. The tasks are the basic units of the analysis.

A total of 154 unique tasks were identified for the 66 unique functions in the mission/task/workload analysis. The unique tasks were alphabetized by object and verb and assigned a numerical identifier ranging from 1 through 154. Appendix D presents the alphabetical list of the tasks and their respective numerical identifiers.

Each task was analyzed to produce the task descriptive data required to develop the workload prediction model. As the analyses were performed, the task descriptive data were entered on Function Analysis Worksheets. An example of a Function Analysis Worksheet is presented in Figure 3. Specifically, Figure 3 presents the task descriptive data for each of the tasks identified in the mission function, Perform

FUNCTION 29 Perform Hover **TOTAL TIME (Approximate) 30 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Altitude	P019	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Attitude	P026	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Heading	P081	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Drift	P062	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Maintain	Obstacle Clearance	P115	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Orient Aircraft K-4/V-3.7	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Check	Obstacle Clearance	C114	External Visual Field (VEX)	Visually Register Obstacles V-1	Make Conditioned Association (Aircraft Clear) C-1			1	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

Figure 3. Example of a CH-47D Function Analysis Worksheet.

Hover. The task descriptive data developed for all of the tasks in each of the 66 unique functions are shown on the Function Analysis Worksheets presented in Appendix E.

The function, Perform Hover, will be used as an example throughout the remainder of this report. Therefore, the reader should refer to Figure 3 while reading the next sections that describe how the task descriptive data were derived during the conduct of the mission/task/workload analysis, and the subsequent section that describes the procedures used to develop the workload prediction model.

The verbs and objects defining the tasks are presented in columns one and two, respectively, of the Function Analysis Worksheets. The numerical identifiers for the respective tasks are presented in column three. The remaining columns present descriptive data that were produced for each task by performing the following analyses:

- identify the appropriate crewmember(s) for each task,
- identify the subsystem(s) associated with each task,
- estimate the workload associated with each task, and
- estimate the time required to perform each task.

Procedures followed in performing the above analyses are described in the next sections of this report.

Identify the Appropriate Crewmember(s) for the Task

Once the tasks were identified for each function, it was necessary to identify the crewmember(s) performing each task. Specifically, it was necessary to determine whether the pilot, copilot, or both crewmembers performed the task within a given function. Information derived from reviews of the operator's and ARTEP manuals and from interviews of CH-47D SMEs provided the basis for assigning the tasks to a given crewmember. In general, all flight control tasks were assigned to the pilot, and all navigation and support tasks were assigned to the copilot.

On the Function Analysis Worksheets, tasks performed by the pilot are indicated by the letter "P" preceding the numerical identifier in the third column; similarly, tasks performed by the copilot are indicated by the letter "C." For example, the data presented in Figure 3 indicate that the task, Check Obstacle Clearance, is performed by the copilot, while the tasks, Control Drift and Maintain Obstacle Clearance, are performed by the pilot.

Identify the Subsystem(s) Associated With Each Task

The next step in the analysis was to identify the subsystem(s) representing the man-machine interface for each task. As shown in Figure 3, the subsystems identified for the CH-47D tasks are listed in the fourth column of the Function Analysis Worksheets. The tasks presented as examples interface with a variety of subsystems. Specifically, the task, Check Obstacle Clearance, is associated with the External Visual Field subsystem only, while the task, Control Altitude, is associated with the Flight Control and the External Visual Field subsystems.

A total of 17 subsystems from 5 major categories were identified for the unique CH-47D mission tasks. Table 1 lists these subsystems with their respective codes assigned to identify them in the computerized data base.

Table 1

List of CH-47D Subsystems

Code	Subsystem
E	Engine Subsystem
EF	Fuel
EIN	Engine Instruments
EI	Ignition
F	Flight Control Subsystem
FB	Brakes
FC	Flight Controls
FI	Flight Instruments
FG	Gear
N	Navigation Subsystem
NM	Maps
NC	Navigation Controls
ND	Navigation Displays
U	Utility Subsystem
UAD	Advisory
UC	Communications
UL	Lighting
US	Survivability
UCA	Cargo
V	Visual Subsystem
VEX	External Visual Field
VG	Night Vision Goggles

Estimate the Workload Associated With Each Task

Workload, as the term is used in this research, is defined as the total attentional demand (i.e., mental workload) placed on the operators as they perform the mission tasks. Consistent with Wickens' theory that workload is a multidimensional construct, the research methodology addresses three different components of workload: sensory, cognitive, and psychomotor (Wickens, 1984). The sensory component refers to the complexity of the visual-unaided (V), visual-aided (G) auditory (A), and/or kinesthetic (K) stimuli to which an operator must attend; the cognitive (C) component refers to the level of information processing required from the operator; the psychomotor (P) component refers to the complexity of the operator's behavioral responses.

To determine the workload for each task, the specific components (i.e., visual-unaided, visual-aided, auditory, kinesthetic, cognitive, and psychomotor) that apply to the task were identified. Then, a short verbal descriptor of the specific workload associated with each of the components was written. The verbal descriptors for each of the tasks performed during the function, Perform Hover, are presented in columns five, six, and seven of the Function Analysis Worksheet presented in Figure 3.

The verbal descriptors of workload were subsequently compared with the verbal anchors on the corresponding workload component scale (see Table 2). The purpose of the comparison was to identify the verbal anchor that represents the "best match" with the verbal descriptor. The rating scale value associated with the verbal anchor identified as the "best match" was assigned to represent the level of workload for that particular component of the task.

For each task, two analysts reached consensus in selecting the verbal anchor that best matched the short verbal descriptor of workload. The consensual matches were subsequently reviewed by CH-47D SMEs. The numerical ratings of the sensory, cognitive, and psychomotor workload associated with the tasks shown in Figure 3 are presented immediately below the corresponding verbal descriptors of workload. For example, the numerical rating of the visual workload associated with the task, Control Drift, is 1; the numerical rating of the kinesthetic workload associated with the task is 4;

Table 2

Workload Component Scales

Scale Value	Verbal Descriptors
	Visual-Unaided (Naked Eye)
1.0	Visually Register/Detect (Detect Occurrence of Image)
3.7	Visually Discriminate (Detect Visual Differences)
4.0	Visually Inspect/Check (Discrete Inspection/Static Condition)
5.0	Visually Locate/Align (Selective Orientation)
5.4	Visually Track/Follow (Maintain Orientation)
5.9	Visually Read (Symbol)
7.0	Visually Scan/Search/Monitor (Continuous/Serial Inspection, Multiple Conditions)
	Visual-Aided (Night Vision Goggles [NVG])
1.0	Visually Register/Detect (Detect Occurrence of Image) with NVG
4.8	Visually Inspect/Check (Discrete Inspection/Static Condition) with NVG
5.0	Visually Discriminate (Detect Visual Differences) with NVG
5.6	Visually Locate/Align (Selective Orientation) with NVG
6.4	Visually Track/Follow (Maintain Orientation) with NVG
7.0	Visually Scan/Search/Monitor (Continuous/Serial Inspection, Multiple Conditions) with NVG
	Auditory
1.0	Detect/Register Sound (Detect Occurrence of Sound)
2.0	Orient to Sound (General Orientation/Attention)
4.2	Orient to Sound (Selective Orientation/Attention)
4.3	Verify Auditory Feedback (Detect Occurrence of Anticipated Sound)
4.9	Interpret Semantic Content (Speech)
6.6	Discriminate Sound Characteristics (Detect Auditory Differences)
7.0	Interpret Sound Patterns (Pulse Rates, Etc.)

Continued on next page.

Table 2: Workload Component Scales (Continued)

Scale Value	Verbal Descriptors
	Kinesthetic
1.0	Detect Discrete Activation of Switch (Toggle, Trigger, Button)
4.0	Detect Preset Position or Status of Object
4.8	Detect Discrete Adjustment of Switch (Discrete Rotary or Discrete Lever Position)
5.5	Detect Serial Movements (Keyboard Entries)
6.1	Detect Kinesthetic Cues Conflicting with Visual Cues
6.7	Detect Continuous Adjustment of Switches (Rotary Rheostat, Thumbwheel)
7.0	Detect Continuous Adjustment of Controls
	Cognitive
1.0	Automatic (Simple Association)
1.2	Alternative Selection
3.7	Sign/Signal Recognition
4.6	Evaluation/Judgment (Consider Single Aspect)
5.3	Encoding/Decoding, Recall
6.8	Evaluation/Judgment (Consider Several Aspects)
7.0	Estimation, Calculation, Conversion
	Psychomotor
1.0	Speech
2.2	Discrete Actuation (Button, Toggle, Trigger)
2.6	Continuous Adjustive (Flight Control, Sensor Control)
4.6	Manipulative
5.8	Discrete Adjustive (Rotary, Vertical Thumbwheel, Lever Position)
6.5	Symbolic Production (Writing)
7.0	Serial Discrete Manipulation (Keyboard Entries)

the numerical rating of the cognitive workload associated with the task is 1; and the numerical rating of the psychomotor workload associated with the task is 2.6.[3]

Estimate the Time Required to Perform Each Task

The final step in conducting the mission/task/workload analysis was to estimate the amount of time required to perform each task. To derive the time estimates, each task was first identified as a discrete fixed, discrete random, or continuous task. These three categories of tasks are defined as follows:

- discrete fixed - tasks that have a definite start and end point within the function (e.g., Set Swivel Switch),
- discrete random - discrete tasks that occur intermittently and/or randomly during a portion of the function (e.g., Check Fuel Quantity Indicator), and
- continuous - tasks that occur continuously throughout the function or a portion of the function (e.g., Monitor Audio).

Once the tasks were categorized as discrete fixed, discrete random, or continuous, the time required to perform each task was estimated to the nearest half-second. The estimates were derived from interviews with CH-47D SMEs. As shown in Figure 3, the estimated duration of the discrete random tasks (e.g., Control Altitude = .5 second) is presented in the ninth column of the Function Analysis Worksheets. No discrete fixed or continuous tasks are depicted in the Figure 3 example. For functions with discrete fixed tasks, the standard duration of the tasks are also entered in the ninth column. For functions with continuous tasks, the estimated duration is entered in the tenth column together with the letter "c" designating the task as continuous.

The total time required to perform all the tasks in a given function is presented in the upper right corner of most Function Analysis Worksheets. Most of the functions identified in the analysis consist of discrete fixed tasks only; the total time for these functions is derived by summing the time required to perform all discrete fixed tasks and adding

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[3] The type of switch that is associated with a specific task is a correlate of workload. Consequently, for each task involving a switch, the type of switch is presented in the eighth column of the Function Analysis Worksheets. None of the tasks depicted in Figure 3 involve a switch.

a half-second transition time between each consecutive task. However, certain functions, including the referent function, Perform Hover, have discrete random tasks that are performed repeatedly for a specified period of time; the total time for these functions is affected by both the length of the discrete random tasks and the total number of times the discrete random tasks occur. The Function Analysis Worksheets for functions with discrete random tasks include a footnote to explain the derivation of the total time. Some functions contain continuous tasks that occur continuously throughout the function or some portion of the function. The duration of these functions generally depends upon the specific segment in which the functions occur. For these functions, the word "continuous" instead of a total time is presented in the upper right corner of the Function Analysis Worksheets.

Development of the Baseline Workload Prediction Model

The mission/task/workload analysis, described in the preceding sections, used a top-down approach to identify the tasks that must be performed to meet the objectives of the CH-47D mission. That is, the analysis started with the mission and proceeded, top-down, through the phases, segments, and functions to the task level. The tasks represent the basic units of analysis for which estimates of workload and time were derived. These data, in turn, constitute a data base that was used to develop a model that predicts workload experienced by CH-47D crewmembers as they perform their mission.

In developing the CH-47D workload prediction model, a "bottom-up" approach was used. The bottom-up approach starts with the basic elements produced by the analysis (i.e., the tasks) and builds upward to the segment level. First, the tasks identified for a specific function are combined to rebuild the functions from which the tasks were originally derived. Then, the functions identified for a specific segment are combined to rebuild the segments from which the functions were originally derived. The technical steps that must be performed to develop the model and to produce estimates of workload are listed below and are graphically depicted in Figure 4:

- write decision rules,
- develop the workload prediction model, and
- exercise the model to produce estimates of workload.

Each of these technical steps is described in detail below.

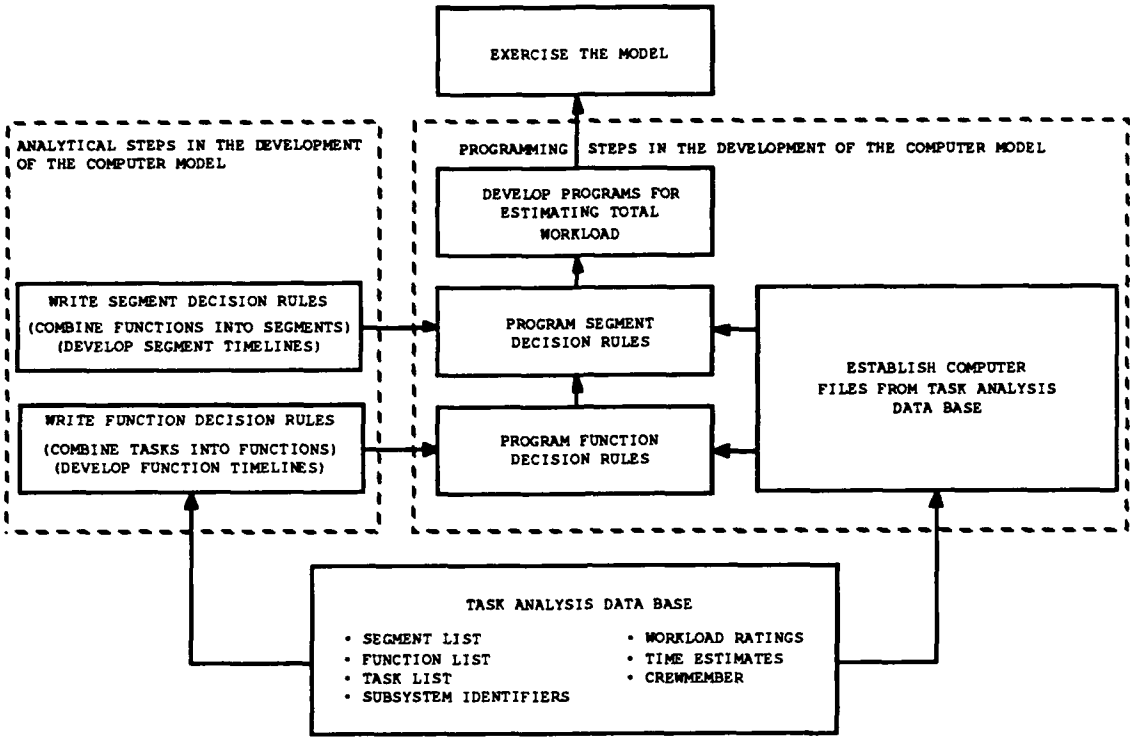

Figure 4. Bottom-up flow diagram outlining the technical steps to be performed in developing the CH-47D workload prediction model.

Write Decision Rules

The first step in developing the workload prediction model was to develop decision rules for building the mission segments from the task data base. First, function decision rules were developed for combining the tasks into functions. Then, segment decision rules were developed to combine the functions into segments. The function and segment decision rules reconstruct the mission to simulate the behavior of each crewmember at each point on the mission timeline. Once the mission timeline has been reconstructed through the implementation of the decision rules, estimates of total workload associated with concurrent tasks can be derived. Specifically, estimates of total workload for each crewmember can be produced for each workload component at half-second intervals throughout the segment. The procedures used to develop the decision rules and to compute the workload totals are described in the following subsections.

Develop function decision rules. Function decision rules were developed for each of the 66 unique functions identified in the mission/task/workload analysis. The decision rules were developed in two stages. First, the tasks performed by each crewmember were identified and listed on worksheets referred to as Function Summary Worksheets. Then, the decision rules for combining the tasks listed on the summary sheets were developed and reported on Function Decision Rules Worksheets. The Function Summary and Decision Rules Worksheets for the function, Perform Hover, are presented in Figures 5 and 6, respectively.

As shown in Figure 5, the Function Summary Worksheets list, by name and code number, all of the tasks performed during a given function. The left half of each summary sheet lists the tasks performed by the pilot, while the right half lists the tasks performed by the copilot. For each crewmember, separate columns identify discrete fixed, discrete random, and continuous tasks performed during the function. The spatial arrangement of the tasks on the worksheets corresponds roughly to the temporal sequence of the tasks. For example, the information presented in column two of Figure 5 indicates that the tasks, Control Altitude and Control Drift, are discrete random tasks performed by the pilot during the function. The information presented in column five of Figure 5 indicates that the copilot will be performing the discrete random task, Check Obstacle Clearance, while the pilot is performing his tasks.

Once the summary worksheets were completed for each function, decision rules were written to describe how the tasks must be combined to form the function. Decision rules for discrete fixed tasks (e.g., Set Swivel Switch) and continuous tasks (e.g., Monitor Flight Controls) simply state the start time and the duration of the tasks on the function timeline. In addition to duration, the decision rules for discrete random tasks (e.g., Control Altitude) state the probability and/or frequency of the random tasks' occurrence within the function (see column two of Figure 6). The Function Summary Worksheet for each unique function is presented in Appendix F; the corresponding Function Decision Rules Worksheets are presented in Appendix G.

Develop segment decision rules. The next step in the development of the model was to write the segment decision rules. The segment decision rules build the mission segments from the functions that were built in the previous step. The segments were developed in two stages: first by developing Segment Summary Worksheets and then by developing Segment Decision Rules Worksheets. Figures 7 and 8, respectively,

FUNCTION 29 Perform Hover

PILOT			COPILOT		
DISCRETE (FIXED)	DISCRETE (RANDOM)	CONTINUOUS	DISCRETE FIXED	DISCRETE (RANDOM)	CONTINUOUS
	Control Altitude (019) Control Attitude (026) Control Heading (081) Control Drift (062) Maintain Obstacle Clearance (115)			Check Obstacle Clearance (114)	

Figure 5. Example of a CH-47D Function Summary Worksheet.

FUNCTION 29 Perform Hover

PILOT			COPILOT		
DISCRETE (FIXED)	DISCRETE (RANDOM)	CONTINUOUS	DISCRETE (FIXED)	DISCRETE (RANDOM)	CONTINUOUS
	Randomly select (.20 probability) Tasks 019, 026, 062, 081, and 115 at .5-second intervals. Continue for 30 seconds. Standby .5 second			25 times during Function 29, randomly select Task 114. Task 114 lasts 1 second.	

Figure 6. Example of a CH-47D Function Decision Rules Worksheet.

PHASE 1 Departure (Assembly Area) **SEGMENT 01 Before Takeoff (Assembly Area)**

PILOT			COPILOT		
DISCRETE (FIXED)	**DISCRETE (RANDOM)**	**CONTINUOUS**	**DISCRETE (FIXED)**	**DISCRETE (RANDOM)**	**CONTINUOUS**
Perform Before Taxi Check (24) Perform Taxi (35) Perform Taxiing Check (37) Perform Before Hover Check (20) Establish Hover (63) Perform Hover (29) Perform Hover Check (30)	Perform Cockpit Communication (Pilot) (26) Perform Cockpit Communication (Copilot) (25)	Monitor Audio (17)	Program Doppler (38) Program Transponder (39) Perform Before Taxi Check (24) Perform Taxi (35) Perform Taxiing Check (37) Perform Before Hover Check (20) Perform Hover (29) Perform Hover Check (30) Perform External Communication (27)	Perform Cockpit Communication (Copilot) (25) Perform Cockpit Communication (Pilot) (26)	Monitor Audio (17)

Figure 7. Example of a CH-47D Segment Summary Worksheet.

PHASE 1 Departure (Assembly Area) **SEGMENT 01 Before Takeoff (Assembly Area)**

PILOT			COPILOT		
DISCRETE (FIXED)	**DISCRETE (RANDOM)**	**CONTINUOUS**	**DISCRETE (FIXED)**	**DISCRETE (RANDOM)**	**CONTINUOUS**
Start Function 24 when Function 39 ends. Function 24 lasts 23.5 seconds. Interrupt Function 24 when Function 25 or 26 occurs. Start Function 35 when Function 24 ends. Function 35 lasts 120.5 seconds. Start Function 37 concurrently with Function 35. Function 37 lasts 21.5 seconds. Interrupt Function 37 when Function 25 or 26 occurs. Start Function 20 when Function 35 ends. Function 20 lasts 188 seconds. Continued...	6 times during the segment, randomly select (.50) Function 25 or Function 26. Functions 25 and 26 last 7 seconds each and cannot occur concurrently with Functions 20, 27, 30, or 63.	Start Segment 01 with Function 17. Function 17 lasts until end of segment.	Start Segment 01 with Function 39. Function 39 lasts 85 seconds. Interrupt Function 39 when Function 25 or 26 occurs. After 2.5 seconds, interrupt Function 39 and start Function 38. Function 38 lasts 389.5 seconds. After Function 38 ends, finish Function 39. Interrupt Function 38 when Function 25 or 26 occurs. Start Function 24 when Function 39 ends. Function 24 lasts 23.5 seconds. Start Function 35 when Function 24 ends. Function 35 lasts 120.5 seconds. Continued...	Insert Function 25 each time the pilot performs Function 25 and Function 26 each time the pilot performs Function 26. Functions 25 and 26 cannot occur concurrently with Functions 20, 27, 30, or 63.	Start Function 17 concurrently with Function 39. Function 17 lasts until the end of segment.

Figure 8. Example of a CH-47D Segment Decision Rules Worksheet.

present the Segment Summary Worksheet and the Segment Decision Rules Worksheet for the segment, Before Takeoff (Assembly Area). The function, Perform Hover, used as the example throughout this report, occurs in this and several other segments.

As shown in Figure 7, the Segment Summary Worksheets list all of the functions performed by the pilot and the copilot during a mission segment. The Segment Summary Worksheets also identify the type of function (i.e., discrete fixed, discrete random, or continuous) performed by the two crewmembers and the approximate temporal arrangement of the functions within the segments. The Segment Decision Rules Worksheets contain the decision rules defining the temporal relationship between the sequence of functions performed by the pilot and the copilot and the times on the segment timeline when the functions begin and end. For example, the decision rule presented in column one of Figure 8 states that, in Segment 01, Before Takeoff (Assembly Area), the pilot begins Function 24, Perform Before Taxi Check, as soon as the copilot completes Function 39, Program Transponder. Thus, Function 24 begins at 474.5 seconds in Segment 01 (i.e., after the 389.5 seconds required for copilot Function 38 plus the 85 seconds required for copilot Function 39). Function 24 lasts 23.5 seconds; therefore, it ends 498 seconds after the segment begins (i.e., 474.5 seconds + 23.5 seconds). The Segment Summary Worksheets for the 37 unique segments are presented in Appendix H, and the Segment Decision Rules Worksheets for the 37 unique segments are presented in Appendix I.

Develop the Workload Prediction Model

The mission/task/workload analysis data entered in the Function Analysis Worksheets in Appendix E and the function and segment decision rules presented in Appendixes G and I were used to develop a computer model that will predict workload for crewmembers of the CH-47D aircraft. The analysis of workload for CH-47D crewmembers will serve two primary functions:

- identify CH-47D tasks and subsystems that are candidates for automation, and
- provide a baseline for comparing workload associated with proposed configurations of the MH-47E aircraft.

The steps that were implemented to develop the computer model consist of the following:

- build task data files,

- enter decision rules into the Task Analysis/Workload (TAWL) software system, and
- generate predicted workload for the baseline CH-47D configuration.

These steps are depicted in the task-flow chart previously presented in Figure 4 and are described in detail below.

Build Task Data Files

The first step in developing the computer model was to build a series of data files from the information derived through the mission/task/workload analysis. The following specific files were established:

- a list of unique mission segments,
- a list of unique functions,
- a list of unique tasks,
- a list of subsystem identifiers,
- estimates of the sensory, cognitive, and psychomotor components of workload for each task, and
- estimates of the duration of each task.

Information contained in the files serves as the data base for developing and exercising the CH-47D workload prediction model.

Enter Decision Rules into the Task Analysis/Workload Software System

The TAWL software system is the data base management system utilized for the CH-47D workload model. The task data from the Function Analysis Worksheets, the function decision rules, and the segment decision rules are entered into TAWL using the data entry routines of the system. The TAWL management system implements the conditions specified in the function decision rules to build functions from the tasks and conditions specified in the segment decision rules to build the segments from the reconstructed functions. TAWL simulates the behavior of both the pilot and the copilot during the segment and identifies all tasks performed by the two crewmembers on each half-second of the segment timeline. Instances in which two or more tasks are performed concurrently are also identified.

Generate Predicted Workload for the Baseline CH-47D Configuration

The ultimate objective of the workload prediction model is to identify instances when two or more concurrent tasks result in operator overload. In meeting this objective, the model produces estimates of total workload experienced by each crewmember at each half-second interval on the mission timeline. The model computes total workload by summing the ratings assigned during the task analysis to each workload component (i.e., visual-unaided, visual-aided, auditory, kinesthetic, cognitive, and psychomotor) of each concurrent task.

The estimates of total workload are used to identify times during the segment when the performance of concurrent tasks results in excessive workload, referred to hereafter as an "overload." Four specific indexes of overload, as defined by Aldrich, Craddock, and McCracken (1984) and Szabo and Bierbaum (1986), are employed in the model; these indexes are described in the following paragraphs.

Component overload. A total value of 8 for any given component of concurrent tasks is designated a component overload. Thus, as many as six component overloads (i.e., visual-unaided, visual-aided, auditory, kinesthetic, cognitive, and psychomotor) may occur for two or more concurrent tasks. The value 8 was chosen as the criterion for a component overload because it exceeds the maximum value on any of the workload component rating scales.

Overload condition. An overload condition exists whenever at least one component overload occurs when combining two or more concurrent tasks. In theory, as many as six component overloads may occur within a single overload condition. The concept of an overload condition is designed to identify the unique conditions within a mission segment that are associated with a component overload.

Overload density. Overload density refers to the percentage of time during a mission segment that a component overload is present. It is calculated by dividing the total number of half-second timelines with component overloads by the total number of half-second timelines in the segment. The number of timelines with component overloads is determined by counting the total number of half-second intervals with a value of 8 or more for at least one of the six workload components. Thus, if component overloads occur at 8 half-second intervals in a segment that lasts a total of 10

seconds (20 half seconds), the overload density is 40% (i.e., 8 ÷ 20).

Subsystem overload. The term "subsystem overload" is used to describe the relationship between a component overload and a subsystem. To identify a subsystem overload, a tally of the component overloads associated with each subsystem is conducted for each of the mission segments. Information derived from the tallies of subsystem overloads is used to identify those subsystems that are associated with high workload.

The model was exercised for all 37 of the unique segments. Under the assumed optimal conditions, and with the pilot and copilot sharing task requirements, no overload conditions were predicted for either crewmember. Thus, the model confirms that under optimal conditions, operational crewmembers can perform the nominal CH-47D missions without encountering overload. The model provides baseline operator workload predictions during performance of the current CH-47D mission. The model can be utilized to predict workload differences resulting from modifications to the aircraft.

Generation of Workload Model for MH-47E Crewmembers

The methodology used to develop the CH-47D baseline workload model will be used to predict workload associated with proposed configurations for the MH-47E aircraft. For example, when advanced technology subsystems and automation options are proposed for the modified aircraft, new workload descriptors will be written for the affected mission tasks. Workload estimates for the new MH-47E tasks will then be generated by comparing the new workload descriptors to the verbal anchors on the workload component scales. Computer files containing the new estimates will be established, and the model will be exercised to predict the effect that the proposed automation options are likely to have on pilot and/or copilot workload. The effect of the automation options will be determined by using the four indexes of workload described above. The estimates of workload generated by the model for the MH-47E configuration will then be compared with those produced by the CH-47D baseline model to identify whether the proposed MH-47E system modifications are likely to increase or decrease operator workload.

CONCLUSION

The workload prediction methodology developed by ARIARDA provides a systematic means for estimating the impact that advanced technology being proposed for new aircraft and for modifications of existing aircraft may have on operator workload. Consequently, the methodology can provide information to assist engineers in making critical design decisions. The CH-47D model provides a valuable tool for making decisions so that costly changes to the MH-47E later in the system development process can be avoided.

In addition, the methodology provides information for identifying emerging manpower, personnel, and training requirements associated with the system modifications. By assisting in the identification of these requirements, the methodology provides a means for factoring total system costs into the system modification program during the early stages of development.

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A P P E N D I X A

SUMMARY OF CH-47D MISSION PHASES AND SEGMENTS

The CH-47D composite mission scenario was divided into 9 unique mission phases. Subsequently, the 9 mission phases were divided into segments. This appendix lists the 9 phases and the 71 mission segments that were derived during the CH-47D mission analysis.

DEPARTURE (AA) PHASE 1

Segment 01: Before Takeoff (Assembly Area)
Segment 02: Takeoff (Assembly Area)
Segment 03: Before Takeoff (Assembly Area) [NVG]
Segment 04: Takeoff (Assembly Area) [NVG]

ENROUTE (AA - PZ) PHASE 2

*Segment 05: Contour Flight
*Segment 06: Contour Flight [NVG]
*Segment 07: Contour Flight (Threat)
*Segment 08: Contour Flight (Threat) [NVG]
*Segment 09: Contour Flight (Mission Change)
*Segment 10: Contour Flight (Mission Change) [NVG]
*Segment 11: Approach
*Segment 12: Landing
*Segment 13: Approach [NVG]
*Segment 14: Landing [NVG]

DEPARTURE (PZ) PHASE 3

Segment 15: Before Takeoff (Internal Load)
*Segment 16: Takeoff
*Segment 17: Takeoff [NVG]
Segment 18: Before Takeoff (External Load)
Segment 19: Takeoff (External)
Segment 20: Before Takeoff (External Load) [NVG]
Segment 21: Takeoff (External) [NVG]

ENROUTE (PZ - LZ) PHASE 4

*Segment 22: NOE Flight
*Segment 23: NOE Flight [NVG]
*Segment 24: NOE Flight (Threat)
*Segment 25: NOE Flight (Threat) [NVG]
*Segment 26: NOE Flight (Mission Change)
*Segment 27: NOE Flight (Mission Change) [NVG]
Segment 28: Approach (LZ)
Segment 29: Landing (LZ, Internal Load)
Segment 30: Landing (LZ, External Load)
Segment 31: Approach (LZ) [NVG]
Segment 32: Landing (LZ, Internal Load) [NVG]
Segment 33: Landing (LZ, External Load) [NVG]

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*Denotes segment that occurs in more than one mission phase.

DEPARTURE (LZ) PHASE 5

Segment 34: Before Takeoff (LZ)
*Segment 16: Takeoff
*Segment 17: Takeoff [NVG]

ENROUTE (LZ - PZ) OR (LZ - FARP) PHASE 6

*Segment 22: NOE Flight
*Segment 23: NOE Flight [NVG]
*Segment 24: NOE Flight (Threat)
*Segment 25: NOE Flight (Threat) [NVG]
*Segment 26: NOE Flight (Mission Change)
*Segment 27: NOE Flight (Mission Change) [NVG]
*Segment 11: Approach
*Segment 12: Landing
*Segment 13: Approach [NVG]
*Segment 14: Landing [NVG]

FARP OPERATIONS PHASE 7

Segment 35: FARP Procedures
Segment 36: FARP Procedures [NVG]
Segment 37: Before Takeoff (FARP)
*Segment 16: Takeoff
*Segment 17: Takeoff [NVG]

ENROUTE (FARP - PZ) PHASE 8

*Segment 22: NOE Flight
*Segment 23: NOE Flight [NVG]
*Segment 24: NOE Flight (Threat)
*Segment 25: NOE Flight (Threat) [NVG]
*Segment 26: NOE Flight (Mission Change)
*Segment 27: NOE Flight (Mission Change) [NVG]
*Segment 11: Approach
*Segment 12: Landing
*Segment 13: Approach [NVG]
*Segment 14: Landing [NVG]

ENROUTE (PZ - AA) PHASE 9

*Segment 05: Contour Flight
*Segment 06: Contour Flight [NVG]
*Segment 07: Contour Flight (Threat)
*Segment 08: Contour Flight (Threat) [NVG]
*Segment 09: Contour Flight (Mission Change)
*Segment 10: Contour Flight (Mission Change) [NVG]
*Segment 11: Approach
*Segment 12: Landing
*Segment 13: Approach [NVG]
*Segment 14: Landing [NVG]

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*Denotes segment that occurs in more than one mission phase.

A P P E N D I X B

ALPHABETICAL LIST OF CH-47D UNIQUE FUNCTIONS

Each mission segment listed in Appendix A was divided into functions during the CH-47D mission analysis. Sixty-six unique functions were identified. Subsequently, the 66 unique functions were ordered in an alphabetical list and a number (1 - 66) was assigned corresponding to the ordinal position within the list. This appendix is an alphabetical list of the functions and the numerical identifiers for the functions.

NUMBER	FUNCTION
01	Adjust Flight Parameters
02	Adjust Flight Parameters [NVG]
03	Check Aircraft Systems (Pilot)
04	Compute Fuel Burn Rate
05	Establish Approach
06	Establish Approach [NVG]
07	Establish Climb
08	Establish Climb [NVG]
09	Establish Level of Flight
10	Establish Level of Flight [NVG]
11	Land Aircraft
12	Land Aircraft [NVG]
13	Load Aircraft (Internal)
14	Load Cargo (External)
15	Load Cargo (External) [NVG]
16	Mission Change
17	Monitor Audio
18	Monitor Threat (Pilot)
19	Perform After Landing Check
20	Perform Before Hover Check
21	Perform Before Landing Check
22	Perform Before Landing Check (LZ)
23	Perform Before Takeoff Check
24	Perform Before Taxi Check
25	Perform Cockpit Communication (Copilot)
26	Perform Cockpit Communication (Pilot)
27	Perform External Communication

NUMBER	FUNCTION
28	Perform External Communication (Threat)
29	Perform Hover
30	Perform Hover Check
31	Perform Hover Check [NVG]
32	Perform Hover [NVG]
33	Perform Navigation
34	Perform Navigation [NVG]
35	Perform Taxi
36	Perform Taxi [NVG]
37	Perform Taxiing Check
38	Program Doppler
39	Program Transponder
40	Refuel Aircraft
41	Respond to Threat
42	Respond to Threat [NVG]
43	Unload Aircraft (Internal)
44	Unload Cargo (External)
45	Update Doppler (Landmark)
46	Update Doppler (Landmark) [NVG]
47	Update Doppler (Mission Change)
48	Update Doppler (PZ)
49	Update Doppler (Stored Destination)
50	Update Doppler (Stored Destination) [NVG]
51	Adjust Approach Parameters
52	Adjust Approach Parameters [NVG]
53	Adjust Climb Parameters
54	Adjust Climb Parameters [NVG]
55	Adjust Level of Flight Parameters
56	Adjust Level of Flight Parameters [NVG]

NUMBER	FUNCTION
57	Check Aircraft Systems (Copilot)
58	Check Approach Parameters
59	Check Climb Parameters
60	Check Flight Parameters
61	Check Fuel Consumption Parameters
62	Check Level of Flight Parameters
63	Establish Hover
64	Establish Hover [NVG]
65	Monitor Threat (Copilot)
66	Monitor Flight Controls

Note. Certain functions were added after the preliminary analysis was conducted. These functions appear at the end of the function list and, consequently, are not in alphabetical order within the list.

A P P E N D I X C

OUTLINE OF CH-47D MISSION SEGMENTS AND FUNCTIONS

A composite mission scenario was developed as the first step in the CH-47D mission/task/workload analysis. Subsequently, the CH-47D composite mission scenario was divided into nine unique mission phases. The nine mission phases subsequently were divided into segments and functions. This appendix is an outline of all the segments and functions as they occur in each of the nine mission phases throughout the entire mission scenario.

1. DEPARTURE (ASSEMBLY AREA)

1.1 Before Takeoff (Assembly Area)

1.1.1 Program Doppler
1.1.2 Program Transponder
1.1.3 Perform Before Taxi Check
1.1.4 Perform Cockpit Communication (Copilot)
1.1.5 Perform Cockpit Communication (Pilot)
1.1.6 Perform Taxi
1.1.7 Perform Taxiing Check
1.1.8 Monitor Audio
1.1.9 Perform Before Hover Check
1.1.10 Establish Hover
1.1.11 Perform Hover
1.1.12 Perform Hover Check
1.1.13 Perform Before Takeoff Check
1.1.14 Perform External Communication

1.2 Takeoff (Assembly Area)

1.2.1 Establish Climb
1.2.2 Adjust Climb Parameters
1.2.3 Check Climb Parameters
1.2.4 Establish Level of Flight
1.2.5 Adjust Level of Flight Parameters
1.2.6 Check Level of Flight Parameters
1.2.7 Check Fuel Consumption Parameters
1.2.8 Monitor Audio
1.2.9 Perform Cockpit Communication (Copilot)
1.2.10 Perform Cockpit Communication (Pilot)
1.2.11 Check Aircraft Systems (Pilot)
1.2.12 Check Aircraft Systems (Copilot)
1.2.13 Monitor Threat (Pilot)
1.2.14 Monitor Threat (Copilot)

1.3 Before Takeoff (Assembly Area) [NVG]

1.3.1 Program Doppler
1.3.2 Program Transponder
1.3.3 Perform Before Taxi Check
1.3.4 Perform Cockpit Communication (Copilot)
1.3.5 Perform Cockpit Communication (Pilot)
1.3.6 Perform Taxi [NVG]
1.3.7 Perform Taxiing Check
1.3.8 Monitor Audio
1.3.9 Perform Before Hover Check
1.3.10 Establish Hover [NVG]
1.3.11 Perform Hover [NVG]
1.3.12 Perform Hover Check [NVG]
1.3.13 Perform Before Takeoff Check
1.3.14 Perform External Communication

1.4 Takeoff (Assembly Area) [NVG]

- 1.4.1 Establish Climb [NVG]
- 1.4.2 Adjust Climb Parameters [NVG]
- 1.4.3 Check Climb Parameters
- 1.4.4 Establish Level of Flight [NVG]
- 1.4.5 Adjust Level of Flight Parameters [NVG]
- 1.4.6 Check Level of Flight Parameters
- 1.4.7 Check Fuel Consumption Parameters
- 1.4.8 Monitor Audio
- 1.4.9 Perform Cockpit Communication (Copilot)
- 1.4.10 Perform Cockpit Communication (Pilot)
- 1.4.11 Check Aircraft Systems (Pilot)
- 1.4.12 Check Aircraft Systems (Copilot)
- 1.4.13 Monitor Threat (Pilot)
- 1.4.14 Monitor Threat (Copilot)

2. ENROUTE (AA-PZ)

2.1 Contour Flight

- 2.1.1 Adjust Flight Parameters
- 2.1.2 Check Flight Parameters
- 2.1.3 Perform Navigation
- 2.1.4 Monitor Threat (Pilot)
- 2.1.5 Monitor Threat (Copilot)
- 2.1.6 Check Aircraft Systems (Pilot)
- 2.1.7 Check Aircraft Systems (Copilot)
- 2.1.8 Update Doppler (Stored Destination)
- 2.1.9 Compute Fuel Burn Rate
- 2.1.10 Update Doppler (Landmark)
- 2.1.11 Monitor Audio
- 2.1.12 Perform Cockpit Communication (Copilot)
- 2.1.13 Perform Cockpit Communication (Pilot)

2.2 Contour Flight [NVG]

- 2.2.1 Adjust Flight Parameters [NVG]
- 2.2.2 Check Flight Parameters
- 2.2.3 Perform Navigation [NVG]
- 2.2.4 Monitor Threat (Pilot)
- 2.2.5 Monitor Threat (Copilot)
- 2.2.6 Check Aircraft Systems (Pilot)
- 2.2.7 Check Aircraft Systems (Copilot)
- 2.2.8 Compute Fuel Burn Rate
- 2.2.9 Update Doppler (Stored Destination) [NVG]
- 2.2.10 Update Doppler (Landmark) [NVG]
- 2.2.11 Monitor Audio
- 2.2.12 Perform Cockpit Communication (Copilot)
- 2.2.13 Perform Cockpit Communication (Pilot)

2.3 Contour Flight (Threat)

- 2.3.1 Adjust Flight Parameters
- 2.3.2 Check Flight Parameters
- 2.3.3 Perform Navigation
- 2.3.4 Monitor Threat (Pilot)
- 2.3.5 Monitor Threat (Copilot)
- 2.3.6 Check Aircraft Systems (Pilot)
- 2.3.7 Check Aircraft Systems (Copilot)
- 2.3.8 Update Doppler (Stored Destination)
- 2.3.9 Compute Fuel Burn Rate
- 2.3.10 Respond to Threat
- 2.3.11 Perform External Communication (Threat)
- 2.3.12 Update Doppler (Landmark)
- 2.3.13 Monitor Audio
- 2.3.14 Perform Cockpit Communication (Copilot)
- 2.3.15 Perform Cockpit Communication (Pilot)

2.4 Contour Flight (Threat) [NVG]

- 2.4.1 Adjust Flight Parameters [NVG]
- 2.4.2 Check Flight Parameters
- 2.4.3 Perform Navigation [NVG]
- 2.4.4 Monitor Threat (Pilot)
- 2.4.5 Monitor Threat (Copilot)
- 2.4.6 Check Aircraft Systems (Pilot)
- 2.4.7 Check Aircraft Systems (Copilot)
- 2.4.8 Update Doppler (Stored Destination) [NVG]
- 2.4.9 Compute Fuel Burn Rate
- 2.4.10 Respond to Threat [NVG]
- 2.4.11 Perform External Communication (Threat)
- 2.4.12 Update Doppler (Landmark) [NVG]
- 2.4.13 Monitor Audio
- 2.4.14 Perform Cockpit Communication (Copilot)
- 2.4.15 Perform Cockpit Communication (Pilot)

2.5 Contour Flight (Mission Change)

- 2.5.1 Adjust Flight Parameters
- 2.5.2 Check Flight Parameters
- 2.5.3 Perform Navigation
- 2.5.4 Monitor Threat (Pilot)
- 2.5.5 Monitor Threat (Copilot)
- 2.5.6 Check Aircraft Systems (Pilot)
- 2.5.7 Check Aircraft Systems (Copilot)
- 2.5.8 Compute Fuel Burn Rate
- 2.5.9 Update Doppler (Landmark)
- 2.5.10 Mission Change
- 2.5.11 Update Doppler (Mission Change)
- 2.5.12 Monitor Audio
- 2.5.13 Perform Cockpit Communication (Copilot)
- 2.5.14 Perform Cockpit Communication (Pilot)

2.6 Contour Flight (Mission Change) [NVG]

- 2.6.1 Adjust Flight Parameters [NVG]
- 2.6.2 Check Flight Parameters
- 2.6.3 Perform Navigation [NVG]
- 2.6.4 Monitor Threat (Pilot)
- 2.6.5 Monitor Threat (Copilot)
- 2.6.6 Check Aircraft Systems (Pilot)
- 2.6.7 Check Aircraft Systems (Copilot)
- 2.6.8 Compute Fuel Burn Rate
- 2.6.9 Update Doppler (Landmark) [NVG]
- 2.6.10 Mission Change
- 2.6.11 Update Doppler (Mission Change)
- 2.6.12 Monitor Audio
- 2.6.13 Perform Cockpit Communication (Copilot)
- 2.6.14 Perform Cockpit Communication (Pilot)

2.7 Approach

- 2.7.1 Perform External Communication
- 2.7.2 Perform Before Landing Check
- 2.7.3 Establish Approach
- 2.7.4 Adjust Approach Parameters
- 2.7.5 Check Approach Parameters
- 2.7.6 Monitor Audio
- 2.7.7 Perform Cockpit Communication (Copilot)
- 2.7.8 Perform Cockpit Communication (Pilot)
- 2.7.9 Monitor Threat (Pilot)
- 2.7.10 Monitor Threat (Copilot)
- 2.7.11 Check Aircraft Systems (Pilot)
- 2.7.12 Check Aircraft Systems (Copilot)

2.8 Landing

- 2.8.1 Establish Hover
- 2.8.2 Perform Hover
- 2.8.3 Land Aircraft
- 2.8.4 Perform After Landing Check
- 2.8.5 Perform External Communication
- 2.8.6 Monitor Audio
- 2.8.7 Perform Cockpit Communication (Copilot)
- 2.8.8 Perform Cockpit Communication (Pilot)

2.9 Approach [NVG]

- 2.9.1 Perform External Communication
- 2.9.2 Perform Before Landing Check
- 2.9.3 Establish Approach [NVG]
- 2.9.4 Adjust Approach Parameters [NVG]
- 2.9.5 Check Approach Parameters
- 2.9.6 Monitor Audio
- 2.9.7 Perform Cockpit Communication (Copilot)
- 2.9.8 Perform Cockpit Communication (Pilot)

2.9 Approach [NVG] [Continued]

2.9.9 Monitor Threat (Pilot)
2.9.10 Monitor Threat (Copilot)
2.9.11 Check Aircraft Systems (Pilot)
2.9.12 Check Aircraft Systems (Copilot)

2.10 Landing [NVG]

2.10.1 Establish Hover [NVG]
2.10.2 Perform Hover [NVG]
2.10.3 Land Aircraft [NVG]
2.10.4 Perform After Landing Check
2.10.5 Perform External Communication
2.10.6 Monitor Audio
2.10.7 Perform Cockpit Communication (Copilot)
2.10.8 Perform Cockpit Communication (Pilot)

3. DEPARTURE (PZ)

3.1 Before Takeoff (Internal Load)

3.1.1 Update Doppler (PZ)
3.1.2 Load Aircraft (Internal)
3.1.3 Perform Cockpit Communication (Copilot)
3.1.4 Perform Cockpit Communication (Pilot)
3.1.5 Monitor Audio
3.1.6 Perform External Communication
3.1.7 Perform Before Takeoff Check

3.2 Takeoff

3.2.1 Establish Hover
3.2.2 Perform Hover
3.2.3 Establish Climb
3.2.4 Adjust Climb Parameters
3.2.5 Check Climb Parameters
3.2.6 Establish Level of Flight
3.2.7 Adjust Level of Flight Parameters
3.2.8 Check Level of Flight Parameters
3.2.9 Check Fuel Consumption Parameters
3.2.10 Monitor Audio
3.2.11 Perform Cockpit Communication (Copilot)
3.2.12 Perform Cockpit Communication (Pilot)
3.2.13 Check Aircraft Systems (Pilot)
3.2.14 Check Aircraft Systems (Copilot)
3.2.15 Monitor Threat (Pilot)
3.2.16 Monitor Threat (Copilot)

3.3 Takeoff [NVG]

- 3.3.1 Establish Hover [NVG]
- 3.3.2 Perform Hover [NVG]
- 3.3.3 Establish Climb [NVG]
- 3.3.4 Adjust Climb Parameters [NVG]
- 3.3.5 Check Climb Parameters
- 3.3.6 Establish Level of Flight [NVG]
- 3.3.7 Adjust Level of Flight Parameters [NVG]
- 3.3.8 Check Level of Flight Parameters
- 3.3.9 Check Fuel Consumption Parameters
- 3.3.10 Monitor Audio
- 3.3.11 Perform Cockpit Communication (Copilot)
- 3.3.12 Perform Cockpit Communication (Pilot)
- 3.3.13 Check Aircraft Systems (Pilot)
- 3.3.14 Check Aircraft Systems (Copilot)
- 3.3.15 Monitor Threat (Pilot)
- 3.3.16 Monitor Threat (Copilot)

3.4 Before Takeoff (External Load)

- 3.4.1 Update Doppler (PZ)
- 3.4.2 Load Aircraft (Internal)
- 3.4.3 Load Cargo (External)
- 3.4.4 Perform Cockpit Communication (Copilot)
- 3.4.5 Perform Cockpit Communication (Pilot)
- 3.4.6 Monitor Audio
- 3.4.7 Perform External Communication
- 3.4.8 Perform Before Takeoff Check

3.5 Takeoff (External)

- 3.5.1 Establish Climb
- 3.5.2 Adjust Climb Parameters
- 3.5.3 Check Climb Parameters
- 3.5.4 Establish Level of Flight
- 3.5.5 Adjust Level of Flight Parameters
- 3.5.6 Check Level of Flight Parameters
- 3.5.7 Check Fuel Consumption Parameters
- 3.5.8 Monitor Audio
- 3.5.9 Perform Cockpit Communication (Copilot)
- 3.5.10 Perform Cockpit Communication (Pilot)
- 3.5.11 Check Aircraft Systems (Pilot)
- 3.5.12 Check Aircraft Systems (Copilot)
- 3.5.13 Monitor Threat (Pilot)
- 3.5.14 Monitor Threat (Copilot)

3.6 Before Takeoff (External Load) [NVG]

- 3.6.1 Update Doppler (PZ)
- 3.6.2 Load Aircraft (Internal)
- 3.6.3 Load Cargo (External) [NVG]
- 3.6.4 Perform Cockpit Communication (Copilot)

3.6 Before Takeoff (External Load) [NVG] [Continued]

3.6.5 Perform Cockpit Communication (Pilot)
3.6.6 Monitor Audio
3.6.7 Perform External Communication
3.6.8 Perform Before Takeoff Check

3.7 Takeoff (External) [NVG]

3.7.1 Establish Climb [NVG]
3.7.2 Adjust Climb Parameters [NVG]
3.7.3 Check Climb Parameters
3.7.4 Establish Level of Flight [NVG]
3.7.5 Adjust Level of Flight Parameters [NVG]
3.7.6 Check Level of Flight Parameters
3.7.7 Check Fuel Consumption Parameters
3.7.8 Monitor Audio
3.7.9 Perform Cockpit Communication (Copilot)
3.7.10 Perform Cockpit Communication (Pilot)
3.7.11 Check Aircraft Systems (Pilot)
3.7.12 Check Aircraft Systems (Copilot)
3.7.13 Monitor Threat (Pilot)
3.7.14 Monitor Threat (Copilot)

4. ENROUTE (PZ-LZ)

4.1 NOE Flight

4.1.1 Adjust Flight Parameters
4.1.2 Check Flight Parameters
4.1.3 Perform Navigation
4.1.4 Monitor Threat (Pilot)
4.1.5 Monitor Threat (Copilot)
4.1.6 Check Aircraft Systems (Pilot)
4.1.7 Check Aircraft Systems (Copilot)
4.1.8 Compute Fuel Burn Rate
4.1.9 Monitor Audio
4.1.10 Perform Cockpit Communication (Copilot)
4.1.11 Perform Cockpit Communication (Pilot)

4.2 NOE Flight [NVG]

4.2.1 Adjust Flight Parameters [NVG]
4.2.2 Check Flight Parameters
4.2.3 Perform Navigation [NVG]
4.2.4 Monitor Threat (Pilot)
4.2.5 Monitor Threat (Copilot)
4.2.6 Check Aircraft Systems (Pilot)
4.2.7 Check Aircraft Systems (Copilot)
4.2.8 Compute Fuel Burn Rate
4.2.9 Monitor Audio
4.2.10 Perform Cockpit Communication (Copilot)
4.2.11 Perform Cockpit Communication (Pilot)

4.3 NOE Flight (Threat)

- 4.3.1 Adjust Flight Parameters
- 4.3.2 Check Flight Parameters
- 4.3.3 Perform Navigation
- 4.3.4 Monitor Threat (Pilot)
- 4.3.5 Monitor Threat (Copilot)
- 4.3.6 Check Aircraft Systems (Pilot)
- 4.3.7 Check Aircraft Systems (Copilot)
- 4.3.8 Compute Fuel Burn Rate
- 4.3.9 Respond to Threat
- 4.3.10 Monitor Audio
- 4.3.11 Perform External Communication (Threat)
- 4.3.12 Perform Cockpit Communication (Copilot)
- 4.3.13 Perform Cockpit Communication (Pilot)

4.4 NOE Flight (Threat) [NVG]

- 4.4.1 Adjust Flight Parameters [NVG]
- 4.4.2 Check Flight Parameters
- 4.4.3 Perform Navigation [NVG]
- 4.4.4 Monitor Threat (Pilot)
- 4.4.5 Monitor Threat (Copilot)
- 4.4.6 Check Aircraft Systems (Pilot)
- 4.4.7 Check Aircraft Systems (Copilot)
- 4.4.8 Compute Fuel Burn Rate
- 4.4.9 Respond to Threat [NVG]
- 4.4.10 Monitor Audio
- 4.4.11 Perform External Communication (Threat)
- 4.4.12 Perform Cockpit Communication (Copilot)
- 4.4.13 Perform Cockpit Communication (Pilot)

4.5 NOE Flight (Mission Change)

- 4.5.1 Adjust Flight Parameters
- 4.5.2 Check Flight Parameters
- 4.5.3 Perform Navigation
- 4.5.4 Monitor Threat (Pilot)
- 4.5.5 Monitor Threat (Copilot)
- 4.5.6 Check Aircraft Systems (Pilot)
- 4.5.7 Check Aircraft Systems (Copilot)
- 4.5.8 Compute Fuel Burn Rate
- 4.5.9 Mission Change
- 4.5.10 Update Doppler (Mission Change)
- 4.5.11 Monitor Audio
- 4.5.12 Perform Cockpit Communication (Copilot)
- 4.5.13 Perform Cockpit Communication (Pilot)

4.6 NOE Flight (Mission Change) [NVG]

- 4.6.1 Adjust Flight Parameters [NVG]
- 4.6.2 Check Flight Parameters
- 4.6.3 Perform Navigation [NVG]
- 4.6.4 Monitor Threat (Pilot)
- 4.6.5 Monitor Threat (Copilot)
- 4.6.6 Check Aircraft Systems (Pilot)
- 4.6.7 Check Aircraft Systems (Copilot)
- 4.6.8 Compute Fuel Burn Rate
- 4.6.9 Mission Change
- 4.6.10 Update Doppler (Mission Change)
- 4.6.11 Monitor Audio
- 4.6.12 Perform Cockpit Communication (Copilot)
- 4.6.13 Perform Cockpit Communication (Pilot)

4.7 Approach (LZ)

- 4.7.1 Perform Before Landing Check (LZ)
- 4.7.2 Establish Approach
- 4.7.3 Adjust Approach Parameters
- 4.7.4 Check Approach Parameters
- 4.7.5 Monitor Audio
- 4.7.6 Perform Cockpit Communication (Copilot)
- 4.7.7 Perform Cockpit Communication (Pilot)
- 4.7.8 Monitor Threat (Pilot)
- 4.7.9 Monitor Threat (Copilot)
- 4.7.10 Check Aircraft Systems (Pilot)
- 4.7.11 Check Aircraft Systems (Copilot)

4.8 Landing (LZ Internal Load)

- 4.8.1 Establish Hover
- 4.8.2 Perform Hover
- 4.8.3 Land Aircraft
- 4.8.4 Monitor Audio
- 4.8.5 Unload Aircraft (Internal)
- 4.8.6 Perform Cockpit Communication (Copilot)
- 4.8.7 Perform Cockpit Communication (Pilot)

4.9 Landing (LZ External Load)

- 4.9.1 Establish Hover
- 4.9.2 Perform Hover
- 4.9.3 Monitor Audio
- 4.9.4 Unload Cargo (External)
- 4.9.5 Land Aircraft
- 4.9.6 Unload Aircraft (Internal)
- 4.9.7 Perform Cockpit Communication (Copilot)
- 4.9.8 Perform Cockpit Communication (Pilot)

4.10 Approach (LZ) [NVG]

- 4.10.1 Perform Before Landing Check (LZ)
- 4.10.2 Establish Approach [NVG]
- 4.10.3 Adjust Approach Parameters [NVG]
- 4.10.4 Check Approach Parameters
- 4.10.5 Monitor Audio
- 4.10.6 Perform Cockpit Communication (Copilot)
- 4.10.7 Perform Cockpit Communication (Pilot)
- 4.10.8 Monitor Threat (Pilot)
- 4.10.9 Monitor Threat (Copilot)
- 4.10.10 Check Aircraft Systems (Pilot)
- 4.10.11 Check Aircraft Systems (Copilot)

4.11 Landing (LZ Internal Load) [NVG]

- 4.11.1 Establish Hover [NVG]
- 4.11.2 Perform Hover [NVG]
- 4.11.3 Land Aircraft [NVG]
- 4.11.4 Monitor Audio
- 4.11.5 Unload Aircraft (Internal)
- 4.11.6 Perform Cockpit Communication (Copilot)
- 4.11.7 Perform Cockpit Communication (Pilot)

4.12 Landing (LZ External Load) [NVG]

- 4.12.1 Establish Hover [NVG]
- 4.12.2 Perform Hover [NVG]
- 4.12.3 Monitor Audio
- 4.12.4 Unload Cargo (External)
- 4.12.5 Land Aircraft [NVG]
- 4.12.6 Unload Aircraft (Internal)
- 4.12.7 Perform Cockpit Communication (Copilot)
- 4.12.8 Perform Cockpit Communication (Pilot)

5. DEPARTURE (LZ)

5.1 Before Takeoff (LZ)

- 5.1.1 Perform Cockpit Communication (Copilot)
- 5.1.2 Perform Cockpit Communication (Pilot)
- 5.1.3 Monitor Audio
- 5.1.4 Update Doppler (PZ)
- 5.1.5 Perform Before Takeoff Check

5.2 Takeoff

- 5.2.1 Establish Hover
- 5.2.2 Perform Hover
- 5.2.3 Establish Climb
- 5.2.4 Adjust Climb Parameters
- 5.2.5 Check Climb Parameters
- 5.2.6 Establish Level of Flight

5.2 Takeoff [Continued]

5.2.7 Adjust Level of Flight Parameters
5.2.8 Check Level of Flight Parameters
5.2.9 Check Fuel Consumption Parameters
5.2.10 Monitor Audio
5.2.11 Perform Cockpit Communication (Copilot)
5.2.12 Perform Cockpit Communication (Pilot)
5.2.13 Check Aircraft Systems (Pilot)
5.2.14 Check Aircraft Systems (Copilot)
5.2.15 Monitor Threat (Pilot)
5.2.16 Monitor Threat (Copilot)

5.3 Takeoff [NVG]

5.3.1 Establish Hover [NVG]
5.3.2 Perform Hover [NVG]
5.3.3 Establish Climb [NVG]
5.3.4 Adjust Climb Parameters [NVG]
5.3.5 Check Climb Parameters
5.3.6 Establish Level of Flight [NVG]
5.3.7 Adjust Level of Flight Parameters [NVG]
5.3.8 Check Level of Flight Parameters
5.3.9 Check Fuel Consumption Parameters
5.3.10 Monitor Audio
5.3.11 Perform Cockpit Communication (Copilot)
5.3.12 Perform Cockpit Communication (Pilot)
5.3.13 Check Aircraft Systems (Pilot)
5.3.14 Check Aircraft Systems (Copilot)
5.3.15 Monitor Threat (Pilot)
5.3.16 Monitor Threat (Copilot)

6. ENROUTE (LZ-PZ) or (LZ-FARP)

6.1 NOE Flight

6.1.1 Adjust Flight Parameters
6.1.2 Check Flight Parameters
6.1.3 Perform Navigation
6.1.4 Monitor Threat (Pilot)
6.1.5 Monitor Threat (Copilot)
6.1.6 Check Aircraft Systems (Pilot)
6.1.7 Check Aircraft Systems (Copilot)
6.1.8 Compute Fuel Burn Rate
6.1.9 Monitor Audio
6.1.10 Perform Cockpit Communication (Copilot)
6.1.11 Perform Cockpit Communication (Pilot)

6.2 NOE Flight [NVG]

- 6.2.1 Adjust Flight Parameters [NVG]
- 6.2.2 Check Flight Parameters
- 6.2.3 Perform Navigation [NVG]
- 6.2.4 Monitor Threat (Pilot)
- 6.2.5 Monitor Threat (Copilot)
- 6.2.6 Check Aircraft Systems (Pilot)
- 6.2.7 Check Aircraft Systems (Copilot)
- 6.2.8 Compute Fuel Burn Rate
- 6.2.9 Monitor Audio
- 6.2.10 Perform Cockpit Communication (Copilot)
- 6.2.11 Perform Cockpit Communication (Pilot)

6.3 NOE Flight (Threat)

- 6.3.1 Adjust Flight Parameters
- 6.3.2 Check Flight Parameters
- 6.3.3 Perform Navigation
- 6.3.4 Monitor Threat (Pilot)
- 6.3.5 Monitor Threat (Copilot)
- 6.3.6 Check Aircraft Systems (Pilot)
- 6.3.7 Check Aircraft Systems (Copilot)
- 6.3.8 Compute Fuel Burn Rate
- 6.3.9 Respond to Threat
- 6.3.10 Monitor Audio
- 6.3.11 Perform External Communication (Threat)
- 6.3.12 Perform Cockpit Communication (Copilot)
- 6.3.13 Perform Cockpit Communication (Pilot)

6.4 NOE Flight (Threat) [NVG]

- 6.4.1 Adjust Flight Parameters [NVG]
- 6.4.2 Check Flight Parameters
- 6.4.3 Perform Navigation [NVG]
- 6.4.4 Monitor Threat (Pilot)
- 6.4.5 Monitor Threat (Copilot)
- 6.4.6 Check Aircraft Systems (Pilot)
- 6.4.7 Check Aircraft Systems (Copilot)
- 6.4.8 Compute Fuel Burn Rate
- 6.4.9 Respond to Threat [NVG]
- 6.4.10 Monitor Audio
- 6.4.11 Perform External Communication (Threat)
- 6.4.12 Perform Cockpit Communication (Copilot)
- 6.4.13 Perform Cockpit Communication (Pilot)

6.5 NOE Flight (Mission Change)

- 6.5.1 Adjust Flight Parameters
- 6.5.2 Check Flight Parameters
- 6.5.3 Perform Navigation
- 6.5.4 Monitor Threat (Pilot)
- 6.5.5 Monitor Threat (Copilot)

6.5 NOE Flight (Mission Change) [Continued]

- 6.5.6 Check Aircraft Systems (Pilot)
- 6.5.7 Check Aircraft Systems (Copilot)
- 6.5.8 Compute Fuel Burn Rate
- 6.5.9 Mission Change
- 6.5.10 Update Doppler (Mission Change)
- 6.5.11 Monitor Audio
- 6.5.12 Perform Cockpit Communication (Copilot)
- 6.5.13 Perform Cockpit Communication (Pilot)

6.6 NOE Flight (Mission Change) [NVG]

- 6.6.1 Adjust Flight Parameters [NVG]
- 6.6.2 Check Flight Parameters
- 6.6.3 Perform Navigation [NVG]
- 6.6.4 Monitor Threat (Pilot)
- 6.6.5 Monitor Threat (Copilot)
- 6.6.6 Check Aircraft Systems (Pilot)
- 6.6.7 Check Aircraft Systems (Copilot)
- 6.6.8 Compute Fuel Burn Rate
- 6.6.9 Mission Change
- 6.6.10 Update Doppler (Mission Change)
- 6.6.11 Monitor Audio
- 6.6.12 Perform Cockpit Communication (Copilot)
- 6.6.13 Perform Cockpit Communication (Pilot)

6.7 Approach

- 6.7.1 Perform External Communication
- 6.7.2 Perform Before Landing Check
- 6.7.3 Establish Approach
- 6.7.4 Adjust Approach Parameters
- 6.7.5 Check Approach Parameters
- 6.7.6 Monitor Audio
- 6.7.7 Perform Cockpit Communication (Copilot)
- 6.7.8 Perform Cockpit Communication (Pilot)
- 6.7.9 Monitor Threat (Pilot)
- 6.7.10 Monitor Threat (Copilot)
- 6.7.11 Check Aircraft Systems (Pilot)
- 6.7.12 Check Aircraft Systems (Copilot)

6.8 Landing

- 6.8.1 Establish Hover
- 6.8.2 Perform Hover
- 6.8.3 Land Aircraft
- 6.8.4 Perform After Landing Check
- 6.8.5 Perform External Communication
- 6.8.6 Monitor Audio
- 6.8.7 Perform Cockpit Communication (Copilot)
- 6.8.8 Perform Cockpit Communication (Pilot)

6.9 Approach [NVG]

- 6.9.1 Perform External Communication
- 6.9.2 Perform Before Landing Check
- 6.9.3 Establish Approach [NVG]
- 6.9.4 Adjust Approach Parameters [NVG]
- 6.9.5 Check Approach Parameters
- 6.9.6 Monitor Audio
- 6.9.7 Perform Cockpit Communication (Copilot)
- 6.9.8 Perform Cockpit Communication (Pilot)
- 6.9.9 Monitor Threat (Pilot)
- 6.9.10 Monitor Threat (Copilot)
- 6.9.11 Check Aircraft Systems (Pilot)
- 6.9.12 Check Aircraft Systems (Copilot)

6.10 Landing [NVG]

- 6.10.1 Establish Hover [NVG]
- 6.10.2 Perform Hover [NVG]
- 6.10.3 Land Aircraft [NVG]
- 6.10.4 Perform After Landing Check
- 6.10.5 Perform External Communication
- 6.10.6 Monitor Audio
- 6.10.7 Perform Cockpit Communication (Copilot)
- 6.10.8 Perform Cockpit Communication (Pilot)

7. FORWARD AREA ARMING AND REFUELING POINT (FARP) OPERATION

7.1 FARP Procedures

- 7.1.1 Perform Taxi
- 7.1.2 Refuel Aircraft
- 7.1.3 Perform Before Taxi Check
- 7.1.4 Perform Taxi
- 7.1.5 Monitor Audio
- 7.1.6 Perform Cockpit Communication (Copilot)
- 7.1.7 Perform Cockpit Communication (Pilot)

7.2 FARP Procedures [NVG]

- 7.2.1 Perform Taxi [NVG]
- 7.2.2 Refuel Aircraft
- 7.2.3 Perform Before Taxi Check
- 7.2.4 Perform Taxi [NVG]
- 7.2.5 Monitor Audio
- 7.2.6 Perform Cockpit Communication (Copilot)
- 7.2.7 Perform Cockpit Communication (Pilot)

7.3 Before Takeoff (FARP)

- 7.3.1 Perform External Communication
- 7.3.2 Update Doppler (PZ)
- 7.3.3 Perform Before Takeoff Check
- 7.3.4 Perform Cockpit Communication (Copilot)
- 7.3.5 Perform Cockpit Communication (Pilot)
- 7.3.6 Monitor Audio

7.4 Takeoff

- 7.4.1 Establish Hover
- 7.4.2 Perform Hover
- 7.4.3 Establish Climb
- 7.4.4 Adjust Climb Parameters
- 7.4.5 Check Climb Parameters
- 7.4.6 Establish Level of Flight
- 7.4.7 Adjust Level of Flight Parameters
- 7.4.8 Check Level of Flight Parameters
- 7.4.9 Check Fuel Consumption Parameters
- 7.4.10 Monitor Audio
- 7.4.11 Perform Cockpit Communication (Copilot)
- 7.4.12 Perform Cockpit Communication (Pilot)
- 7.4.13 Check Aircraft Systems (Pilot)
- 7.4.14 Check Aircraft Systems (Copilot)
- 7.4.15 Monitor Threat (Pilot)
- 7.4.16 Monitor Threat (Copilot)

7.5 Takeoff [NVG]

- 7.5.1 Establish Hover [NVG]
- 7.5.2 Perform Hover [NVG]
- 7.5.3 Establish Climb [NVG]
- 7.5.4 Adjust Climb Parameters [NVG]
- 7.5.5 Check Climb Parameters
- 7.5.6 Establish Level of Flight [NVG]
- 7.5.7 Adjust Level of Flight Parameters [NVG]
- 7.5.8 Check Level of Flight Parameters
- 7.5.9 Check Fuel Consumption Parameters
- 7.5.10 Monitor Audio
- 7.5.11 Perform Cockpit Communication (Copilot)
- 7.5.12 Perform Cockpit Communication (Pilot)
- 7.5.13 Check Aircraft Systems (Pilot)
- 7.5.14 Check Aircraft Systems (Copilot)
- 7.5.15 Monitor Threat (Pilot)
- 7.5.16 Monitor Threat (Copilot)

8. ENROUTE (FARP-PZ)

8.1 NOE Flight

8.1.1 Adjust Flight Parameters
8.1.2 Check Flight Parameters
8.1.3 Perform Navigation
8.1.4 Monitor Threat (Pilot)
8.1.5 Monitor Threat (Copilot)
8.1.6 Check Aircraft Systems (Pilot)
8.1.7 Check Aircraft Systems (Copilot)
8.1.8 Compute Fuel Burn Rate
8.1.9 Monitor Audio
8.1.10 Perform Cockpit Communication (Copilot)
8.1.11 Perform Cockpit Communication (Pilot)

8.2 NOE Flight [NVG]

8.2.1 Adjust Flight Parameters [NVG]
8.2.2 Check Flight Parameters
8.2.3 Perform Navigation [NVG]
8.2.4 Monitor Threat (Pilot)
8.2.5 Monitor Threat (Copilot)
8.2.6 Check Aircraft Systems (Pilot)
8.2.7 Check Aircraft Systems (Copilot)
8.2.8 Compute Fuel Burn Rate
8.2.9 Monitor Audio
8.2.10 Perform Cockpit Communication (Copilot)
8.2.11 Perform Cockpit Communication (Pilot)

8.3 NOE Flight (Threat)

8.3.1 Adjust Flight Parameters
8.3.2 Check Flight Parameters
8.3.3 Perform Navigation
8.3.4 Monitor Threat (Pilot)
8.3.5 Monitor Threat (Copilot)
8.3.6 Check Aircraft Systems (Pilot)
8.3.7 Check Aircraft Systems (Copilot)
8.3.8 Compute Fuel Burn Rate
8.3.9 Respond to Threat
8.3.10 Monitor Audio
8.3.11 Perform External Communication (Threat)
8.3.12 Perform Cockpit Communication (Copilot)
8.3.13 Perform Cockpit Communication (Pilot)

8.4 NOE Flight (Threat) [NVG]

8.4.1 Adjust Flight Parameters [NVG]
8.4.2 Check Flight Parameters
8.4.3 Perform Navigation [NVG]
8.4.4 Monitor Threat (Pilot)
8.4.5 Monitor Threat (Copilot)
8.4.6 Check Aircraft Systems (Pilot)

8.4 NOE Flight (Threat) [NVG] [Continued]

- 8.4.7 Check Aircraft Systems (Copilot)
- 8.4.8 Compute Fuel Burn Rate
- 8.4.9 Respond to Threat [NVG]
- 8.4.10 Monitor Audio
- 8.4.11 Perform External Communication (Threat)
- 8.4.12 Perform Cockpit Communication (Copilot)
- 8.4.13 Perform Cockpit Communication (Pilot)

8.5 NOE Flight (Mission Change)

- 8.5.1 Adjust Flight Parameters
- 8.5.2 Check Flight Parameters
- 8.5.3 Perform Navigation
- 8.5.4 Monitor Threat (Pilot)
- 8.5.5 Monitor Threat (Copilot)
- 8.5.6 Check Aircraft Systems (Pilot)
- 8.5.7 Check Aircraft Systems (Copilot)
- 8.5.8 Compute Fuel Burn Rate
- 8.5.9 Mission Change
- 8.5.10 Update Doppler (Mission Change)
- 8.5.11 Monitor Audio
- 8.5.12 Perform Cockpit Communication (Copilot)
- 8.5.13 Perform Cockpit Communication (Pilot)

8.6 NOE Flight (Mission Change) [NVG]

- 8.6.1 Adjust Flight Parameters [NVG]
- 8.6.2 Check Flight Parameters
- 8.6.3 Perform Navigation [NVG]
- 8.6.4 Monitor Threat (Pilot)
- 8.6.5 Monitor Threat (Copilot)
- 8.6.6 Check Aircraft Systems (Pilot)
- 8.6.7 Check Aircraft Systems (Copilot)
- 8.6.8 Compute Fuel Burn Rate
- 8.6.9 Mission Change
- 8.6.10 Update Doppler (Mission Change)
- 8.6.11 Monitor Audio
- 8.6.12 Perform Cockpit Communication (Copilot)
- 8.6.13 Perform Cockpit Communication (Pilot)

8.7 Approach

- 8.7.1 Perform External Communication
- 8.7.2 Perform Before Landing Check
- 8.7.3 Establish Approach
- 8.7.4 Adjust Approach Parameters
- 8.7.5 Check Approach Parameters
- 8.7.6 Monitor Audio
- 8.7.7 Perform Cockpit Communication (Copilot)
- 8.7.8 Perform Cockpit Communication (Pilot)
- 8.7.9 Monitor Threat (Pilot)

8.7 Approach [Continued]

8.7.10 Monitor Threat (Copilot)
8.7.11 Check Aircraft Systems (Pilot)
8.7.12 Check Aircraft Systems (Copilot)

8.8 Landing

8.8.1 Establish Hover
8.8.2 Perform Hover
8.8.3 Land Aircraft
8.8.4 Perform After Landing Check
8.8.5 Perform External Communication
8.8.6 Monitor Audio
8.8.7 Perform Cockpit Communication (Copilot)
8.8.8 Perform Cockpit Communication (Pilot)

8.9 Approach [NVG]

8.9.1 Perform External Communication
8.9.2 Perform Before Landing Check
8.9.3 Establish Approach [NVG]
8.9.4 Adjust Approach Parameters [NVG]
8.9.5 Check Approach Parameters
8.9.6 Monitor Audio
8.9.7 Perform Cockpit Communication (Copilot)
8.9.8 Perform Cockpit Communication (Pilot)
8.9.9 Monitor Threat (Pilot)
8.9.10 Monitor Threat (Copilot)
8.9.11 Check Aircraft Systems (Pilot)
8.9.12 Check Aircraft Systems (Copilot)

8.10 Landing [NVG]

8.10.1 Establish Hover [NVG]
8.10.2 Perform Hover [NVG]
8.10.3 Land Aircraft [NVG]
8.10.4 Perform After Landing Check
8.10.5 Perform External Communication
8.10.6 Monitor Audio
8.10.7 Perform Cockpit Communication (Copilot)
8.10.8 Perform Cockpit Communication (Pilot)

9. ENROUTE (PZ-AA)

9.1 Contour Flight

9.1.1 Adjust Flight Parameters
9.1.2 Check Flight Parameters
9.1.3 Perform Navigation
9.1.4 Monitor Threat (Pilot)
9.1.5 Monitor Threat (Copilot)
9.1.6 Check Aircraft Systems (Pilot)

9.1 Contour Flight [Continued]

- 9.1.7 Check Aircraft Systems (Copilot)
- 9.1.8 Update Doppler (Stored Destination)
- 9.1.9 Compute Fuel Burn Rate
- 9.1.10 Update Doppler (Landmark)
- 9.1.11 Monitor Audio
- 9.1.12 Perform Cockpit Communication (Copilot)
- 9.1.13 Perform Cockpit Communication (Pilot)

9.2 Contour Flight [NVG]

- 9.2.1 Adjust Flight Parameters [NVG]
- 9.2.2 Check Flight Parameters
- 9.2.3 Perform Navigation [NVG]
- 9.2.4 Monitor Threat (Pilot)
- 9.2.5 Monitor Threat (Copilot)
- 9.2.6 Check Aircraft Systems (Pilot)
- 9.2.7 Check Aircraft Systems (Copilot)
- 9.2.8 Compute Fuel Burn Rate
- 9.2.9 Update Doppler (Stored Destination) [NVG]
- 9.2.10 Update Doppler (Landmark) [NVG]
- 9.2.11 Monitor Audio
- 9.2.12 Perform Cockpit Communication (Copilot)
- 9.2.13 Perform Cockpit Communication (Pilot)

9.3 Contour Flight (Threat)

- 9.3.1 Adjust Flight Parameters
- 9.3.2 Check Flight Parameters
- 9.3.3 Perform Navigation
- 9.3.4 Monitor Threat (Pilot)
- 9.3.5 Monitor Threat (Copilot)
- 9.3.6 Check Aircraft Systems (Pilot)
- 9.3.7 Check Aircraft Systems (Copilot)
- 9.3.5 Update Doppler (Stored Destination)
- 9.3.6 Compute Fuel Burn Rate
- 9.3.7 Respond to Threat
- 9.3.8 Perform External Communication (Threat)
- 9.3.9 Update Doppler (Landmark)
- 9.3.10 Monitor Audio
- 9.3.11 Perform Cockpit Communication (Copilot)
- 9.3.12 Perform Cockpit Communication (Pilot)

9.4 Contour Flight (Threat) [NVG]

- 9.4.1 Adjust Flight Parameters [NVG]
- 9.4.2 Check Flight Parameters
- 9.4.3 Perform Navigation [NVG]
- 9.4.4 Monitor Threat (Pilot)
- 9.4.5 Monitor Threat (Copilot)
- 9.4.6 Check Aircraft Systems (Pilot)
- 9.4.7 Check Aircraft Systems (Copilot)

9.4 Contour Flight (Threat) [NVG] [Continued]

- 9.4.8 Update Doppler (Stored Destination) [NVG]
- 9.4.9 Compute Fuel Burn Rate
- 9.4.10 Respond to Threat [NVG]
- 9.4.11 Perform External Communication (Threat)
- 9.4.12 Update Doppler (Landmark) [NVG]
- 9.4.13 Monitor Audio
- 9.4.14 Perform Cockpit Communication (Copilot)
- 9.4.15 Perform Cockpit Communication (Pilot)

9.5 Contour Flight (Mission Change)

- 9.5.1 Adjust Flight Parameters
- 9.5.2 Check Flight Parameters
- 9.5.3 Perform Navigation
- 9.5.4 Monitor Threat (Pilot)
- 9.5.5 Monitor Threat (Copilot)
- 9.5.6 Check Aircraft Systems (Pilot)
- 9.5.7 Check Aircraft Systems (Copilot)
- 9.5.8 Compute Fuel Burn Rate
- 9.5.9 Update Doppler (Landmark)
- 9.5.10 Mission Change
- 9.5.11 Update Doppler (Mission Change)
- 9.5.12 Monitor Audio
- 9.5.13 Perform Cockpit Communication (Copilot)
- 9.5.14 Perform Cockpit Communication (Pilot)

9.6 Contour Flight (Mission Change) [NVG]

- 9.6.1 Adjust Flight Parameters [NVG]
- 9.6.2 Check Flight Parameters
- 9.6.3 Perform Navigation [NVG]
- 9.6.4 Monitor Threat (Pilot)
- 9.6.5 Monitor Threat (Copilot)
- 9.6.6 Check Aircraft Systems (Pilot)
- 9.6.7 Check Aircraft Systems (Copilot)
- 9.6.8 Compute Fuel Burn Rate
- 9.6.9 Update Doppler (Landmark) [NVG]
- 9.6.10 Mission Change
- 9.6.11 Update Doppler (Mission Change)
- 9.6.12 Monitor Audio
- 9.6.13 Perform Cockpit Communication (Copilot)
- 9.6.14 Perform Cockpit Communication (Pilot)

9.7 Approach

- 9.7.1 Perform External Communication
- 9.7.2 Perform Before Landing Check
- 9.7.3 Establish Approach
- 9.7.4 Adjust Approach Parameters
- 9.7.5 Check Approach Parameters
- 9.7.6 Monitor Audio

9.7 Approach [Continued]

- 9.7.7 Perform Cockpit Communication (Copilot)
- 9.7.8 Perform Cockpit Communication (Pilot)
- 9.7.9 Monitor Threat (Pilot)
- 9.7.10 Monitor Threat (Copilot)
- 9.7.11 Check Aircraft Systems (Pilot)
- 9.7.12 Check Aircraft Systems (Copilot)

9.8 Landing

- 9.8.1 Establish Hover
- 9.8.2 Perform Hover
- 9.8.3 Land Aircraft
- 9.8.4 Perform After Landing Check
- 9.8.5 Perform External Communication
- 9.8.6 Monitor Audio
- 9.8.7 Perform Cockpit Communication (Copilot)
- 9.8.8 Perform Cockpit Communication (Pilot)

9.9 Approach [NVG]

- 9.9.1 Perform External Communication
- 9.9.2 Perform Before Landing Check
- 9.9.3 Establish Approach [NVG]
- 9.9.4 Adjust Approach Parameters [NVG]
- 9.9.5 Check Approach Parameters
- 9.9.6 Monitor Audio
- 9.9.7 Perform Cockpit Communication (Copilot)
- 9.9.8 Perform Cockpit Communication (Pilot)
- 9.9.9 Monitor Threat (Pilot)
- 9.9.10 Monitor Threat (Copilot)
- 9.9.11 Check Aircraft Systems (Pilot)
- 9.9.12 Check Aircraft Systems (Copilot)

9.10 Landing [NVG]

- 9.10.1 Establish Hover [NVG]
- 9.10.2 Perform Hover [NVG]
- 9.10.3 Land Aircraft [NVG]
- 9.10.4 Perform After Landing Check
- 9.10.5 Perform External Communication
- 9.10.6 Monitor Audio
- 9.10.7 Perform Cockpit Communication (Copilot)
- 9.10.8 Perform Cockpit Communication (Pilot)

A P P E N D I X D

ALPHABETICAL LIST OF CH-47D UNIQUE TASKS

During the CH-47D mission/task/workload analysis, each of the 66 functions was divided into tasks. A task defines a specific crew activity that is essential to the successful performance of the selected function. A total of 154 unique tasks was identified for the 66 functions. This appendix is an alphabetical list of the 154 tasks with assigned task numbers.

TASK NUMBER	VERB	OBJECT
001	Receive	Acknowledgment
002	Transmit	Acknowledgment
003	Set	AFCS ALT Switch
004	Perform	AFCS Check (Hover)
005	Perform	AFCS Check (Hover) [NVG]
006	Set	AFCS HDG Switch
007	Set	AFCS SEL Switch
008	Maneuver	Aircraft Across Landmark
009	Maneuver	Aircraft Across Landmark [NVG]
010	Verify	Aircraft Location
011	Verify	Aircraft Location [NVG]
012	Control	Airspeed
013	Check	Airspeed Indicator (Inflight)
014	Change	Airspeed Quickly
015	Change	Airspeed Quickly [NVG]
016	Control	Airspeed [NVG]
017	Check	Altimeter (Inflight)
018	Adjust	Altitude
019	Control	Altitude
020	Change	Altitude Sharply
021	Change	Altitude Sharply [NVG]
022	Adjust	Altitude [NVG]
023	Control	Altitude [NVG]
024	Set	ANT Switch
025	Adjust	Attitude
026	Control	Attitude

TASK NUMBER	VERB	OBJECT
027	Adjust	Attitude [NVG]
028	Control	Attitude [NVG]
029	Monitor	Audio
030	Check	Brakes (Copilot)
031	Check	Brakes (Pilot)
032	Compute	Burn Out
033	Set	Cargo Hook Master Switch
034	Press	Cargo Release Button
035	Receive	Communication (Copilot)
036	Transmit	Communication (Copilot)
037	Receive	Communication (Crew Chief)
038	Transmit	Communication (Crew Chief)
039	Receive	Communication (Pilot)
040	Transmit	Communication (Pilot)
041	Check	Coordinates
042	Copy	Coordinates
043	Set	Countermeasure Switch
044	Follow	Course
045	Follow	Course [NVG]
046	Check	Crew
047	Check	Cyclic Trim Indicator
048	Check	Cyclic Trim Switch
049	Set	DEST DISP Thumbwheel
050	Check	Direction Display
051	Press	Doppler Data Entry Key
052	Check	Doppler Dim Switch
053	Check	Doppler Display
054	Monitor	Doppler Display
055	Set	Doppler Display Selector Switch

TASK NUMBER	VERB	OBJECT
056	Press	Doppler KYBD Key
057	Enter	Doppler Magnetic Variation
058	Set	Doppler Mode Switch
059	Check	Doppler Panel Lights
060	Enter	Doppler Spheroid Data
061	Enter	Doppler Zone Data
062	Control	Drift
063	Control	Drift [NVG]
064	Check	Engine Instruments
065	Check	Engine Instruments (Hover)
066	Press	Flare Dispenser Switch
067	Set	Flare Dispenser Switch
068	Neutralize	Flight Controls
069	Check	Flight Controls (Hover)
070	Check	Flight Controls (Hover) [NVG]
071	Check	Flight Instruments (Hover)
072	Set	FLY-TO-DEST Switch
073	Control	Forward Motion (Taxi)
074	Control	Forward Motion (Taxi) [NVG]
075	C. eck	Fuel Flow Indicator
076	Check	Fuel Quantity Indicator
077	Monitor	Fuel Quantity Indicator
078	Perform	Hard Turns
079	Perform	Hard Turns [NVG]
080	Adjust	Heading
081	Control	Heading
082	Control	Heading (Taxi)
083	Control	Heading (Taxi) [NVG]
084	Check	Heading Indicator (Inflight)

TASK NUMBER	VERB	OBJECT
085	Adjust	Heading [NVG]
086	Control	Heading [NVG]
087	Perform	HIT Check
088	Check	Hook Open Light
089	Set	Hook Select Switch
090	Verify	Load Hookup
091	Verify	Load on Ground
092	Verify	Load Released
093	Check	Load Secure
094	Verify	Load Secure
095	Monitor	Loading
096	Set	M-1 Switch
097	Set	M-1 Test Switch
098	Set	M-2 Switch
099	Set	M-2 Test Switch
100	Set	M-3 Switch
101	Set	M-3 Test Switch
102	Set	M-C Switch
103	Set	M-C Test Switch
104	Read	Maps
105	Check	Master CAUTION/WARNING Panel
106	Set	Master Switch (Transponder)
107	Receive	Message
108	Transmit	Message
109	Transmit	Message (Brief)
110	Note	Message Alert
111	Set	Mode 1 Code
112	Set	Mode 3A Code
113	Set	Mode 4 Switch

TASK NUMBER	VERB	OBJECT
114	Check	Obstacle Clearance
115	Maintain	Obstacle Clearance
116	Check	Obstacle Clearance [NVG]
117	Maintain	Obstacle Clearance [NVG]
118	Check	Park Brake
119	Release	Park Brake
120	Set	Park Brake
121	Set	Park Brake Lever
122	Check	Park Brake Light
123	Adjust	Power
124	Perform	Power Check (Hover)
125	Check	Power Steering
126	Adjust	Power [NVG]
127	Check	Radios
128	Control	Rate of Climb
129	Control	Rate of Climb [NVG]
130	Control	Rate of Descent
131	Control	Rate of Descent [NVG]
132	Check	Refueling Complete
133	Check	Reply Light
134	Check	Rotor RPM
135	Check	Route
136	Check	Swivel Switch
137	Set	Swivel Switch
138	Set	Target Storage Switch
139	Check	Test Light
140	Check	Test/MON Light
141	Detect	Threat
142	Note	Time

TASK NUMBER	VERB	OBJECT
143	Perform	Touchdown
144	Perform	Touchdown [NVG]
145	Set	Transmitter Selector Switch
146	Adjust	Trim
147	Check	Trim Ball (Inflight)
148	Adjust	Trim [NVG]
149	Monitor	Unloading
150	Verify	Unloading Complete
151	Enter	UTM Coordinates
152	Check	Vertical Situation Indicator (Inflight)
153	Check	% TRQ Indicator (Inflight)
154	Monitor	Flight Controls

A P P E N D I X E

CH-47D FUNCTION ANALYSIS WORKSHEETS

During the CH-47D mission/task/workload analysis, descriptive information was compiled for each of the 154 unique tasks. The descriptive information for each task was compiled on a Function Analysis Worksheet using a standardized format. This appendix contains the Function Analysis Worksheet for each of the 66 unique functions. The Function Analysis Worksheets provide the following information:

- function name,
- function number,
- total time of function,
- task identifiers with verb and object,
- task numbers,
- subsystems associated with each task,
- verbal descriptors of sensory components and workload ratings,
- verbal descriptors of cognitive components and workload ratings,
- verbal descriptors of psychomotor components and workload ratings,
- descriptions of switches if used to perform the tasks, and
- times required to perform the tasks.

FUNCTION 01 Adjust Flight Parameters **TOTAL TIME (Approximate) Continuous***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Attitude	P026	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Adjust	Altitude	P018	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Airspeed	P012	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Adjust	Power	P123	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Adjust	Heading	P080	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Adjust	Trim	P146	Flight Control (FC)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Maintain	Obstacle Clearance	P115	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Orient Aircraft K-4/V-3.7	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	

*The total time for the function will vary depending on the length of the segment.

FUNCTION 02 Adjust Flight Parameters [NVG] **TOTAL TIME (Approximate) Continuous***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Attitude [NVG]	P028	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Adjust	Altitude [NVG]	P022	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Airspeed [NVG]	P016	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Adjust	Power [NVG]	P126	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Adjust	Heading [NVG]	P085	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Adjust	Trim [NVG]	P148	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Maintain	Obstacle Clearance [NVG]	P117	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Orient Aircraft K-4/G-5	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	

*The total time for the function will vary depending on the length of the segment.

FUNCTION 03 Check Aircraft Systems (Pilot) **TOTAL TIME (Approximate) 10.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Engine Instruments	B064	Engine Instruments (EIN)	Visually Inspect Instrument Indications V-4	Interpret Sensory and Symbolic Readouts and Verify Correct Status (Readouts Within Limits) C-3.7			5	
Check	Master CAUTION/WARNING Panel	B105	Advisory (UAD)	Visually Inspect and Register Lights V-1	Verify Correct Status (No Lights Illuminated) C-1.2			1	
Check	Fuel Quantity Indicator	B076	Fuel (EF)	Visually Inspect Instrument Indication V-4	Interpret Symbolic Readout (Quantity) and Make Judgment (Enough Fuel) C-4.6			3	
Monitor	Flight Controls	P154	Flight Control (FC)	Make Conditioned Association K-1	Make Conditioned Association C-1	Control Pressure P-2.6			(c)

FUNCTION 04 Compute Fuel Burn Rate **TOTAL TIME (Approximate) 45 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Fuel Quantity Indicator	C076	Fuel (EF)	Visually Inspect Instrument Indication V-4	Interpret Symbolic Readout (Quantity) and Make Judgment (Enough Fuel) C-4.6			3	
Check	Fuel Flow Indicator	C075	Fuel (EF)	Visually Inspect Instrument Indication V-4	Interpret Symbolic Readout C-3.7			3	
Note	Time	C142	Fuel (EF)	Visually Check Instrument Indication V-4	Interpret Readout C-3.7	Write Information P-6.5		7	
Compute	Burn Out	C032	Fuel (EF)	Read Symbols V-5.9	Calculate Fuel Consumption Rate C-6.8	Write Information P-6.5		30	

FUNCTION 05 Establish Approach **TOTAL TIME (Approximate) 4.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	
Adjust	Power	P123	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	

FUNCTION 06 Establish Approach [NVG] **TOTAL TIME (Approximate) 5.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	
Adjust	Power [NVG]	P126	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		2	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	

FUNCTION 07 Establish Climb **TOTAL TIME (Approximate) 4.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	
Adjust	Power	P123	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	

FUNCTION 08 Establish Climb [NVG] **TOTAL TIME (Approximate) 5.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	
Adjust	Power [NVG]	P126	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		2	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	

FUNCTION 09 Establish Level of Flight **TOTAL TIME (Approximate) 6 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Adjust	Attitude	P025	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Adjust	Power	P123	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	

FUNCTION 10 Establish Level of Flight [NVG] **TOTAL TIME (Approximate) 7 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Adjust	Attitude [NVG]	P027	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Adjust	Power [NVG]	P126	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		2	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	

FUNCTION 11 Land Aircraft **TOTAL TIME (Approximate) 13.5 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Maintain	Obstacle Clearance	P115	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Orient Aircraft K-4/V-3.7	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Adjust	Power	P123	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Attitude	P026	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Heading	P081	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Drift	P062	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Perform	Touchdown	P143	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Orient Aircraft K-4/V-3.7	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		3	
Check	Obstacle Clearance	C-14	External Visual Field (VEX)	Visually Register Obstacles V-1	Make Conditioned Association (Aircraft Clear) C-1			1	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 12 **Land Aircraft [NVG]**

TOTAL TIME (Approximate) **44 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Maintain	Obstacle Clearance [NVG]	P117	Flight Control/ Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Orient Aircraft K-4/G-5	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Adjust	Power [NVG]	P126	Flight Control/ Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement and Monitor Instrument Indications K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Attitude [NVG]	P028	Flight Control/ Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement and Monitor Instrument Indications K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Heading [NVG]	P086	Flight Control/ Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement and Monitor Instrument Indications K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Drift [NVG]	P063	Flight Control/ Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Perform	Touchdown [NVG]	P144	Flight Control/ Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Orient Aircraft K-4/G-5	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		5	
Check	Obstacle Clearance [NVG]	C116	Night Vision Goggles (VG)	Visually Register Obstacles G-1	Make Conditioned Association (Aircraft Clear) C-1			3	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 13 Load Aircraft (Internal) **TOTAL TIME (Approximate) 73 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Monitor	Loading	C095	Cargo (UCA)	Visually Scan Cargo Compartment V-7	Verify Correct Procedure C-1.2	Move Head P-2.6		60	
Verify	Load Secure	C094	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			5	
Transmit	Communication (Crewchief)	B038	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message (Ramp/ Door Check) C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions	3	
Receive	Communication (Crewchief)	B037	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	

FUNCTION 14 Load Cargo (External) **TOTAL TIME (Approximate) 250 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Cargo Hook Master Switch	C033	Cargo (UCA)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ARM) C-1.2	Move Switch P-2.2	Toggle - 2 Positions (T-2)	1	
Set	Hook Select Switch	C089	Cargo (UCA)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position C-1.2	Turn Switch P-5.8	Rotary - 5 Positions (R-5)	2	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	
Adjust	Power	P123	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	
Control	Altitude	P019	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Attitude	P026	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Heading	P081	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	

FUNCTION 14 Load Cargo (External) [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Drift	P062	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Receive	Communication (Crewchief)	B037	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3				(c)
Verify	Load Hookup	C090	Communication (UC)	Receive Auditory Message A-4.9	Decode Message and Verify Correct Status (Hook Light Extinguished) C-3.7			3	

FUNCTION 15 Load Cargo (External) [NVG] **TOTAL TIME (Approximate) 350 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Cargo Hook Master Switch	C033	Cargo (UCA)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ARM) C-1.2	Move Switch P-2.2	Toggle - 2 Positions (T-2)	1	
Set	Hook Select Switch	C089	Cargo (UCA)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position C-1.2	Turn Switch P-5.8	Rotary - 5 Positions (R-5)	4	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	
Adjust	Power [NVG]	P126	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		2	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits C-3.7	Control Pressure P-2.6		1	
Control	Altitude [NVG]	P023	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Attitude [NVG]	P028	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Heading [NVG]	P086	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	

FUNCTION 15 Load Cargo (External) [NVG] [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Drift [NVG]	P063	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Receive	Communication (Crewchief)	B037	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3				(c)
Verify	Load Hookup	C090	Communication (UC)	Receive Auditory Message A-4.9	Decode Message and Verify Correct Status (Hook Light Extinguished) C-3.7			3	

FUNCTION 16 Mission Change **TOTAL TIME (Approximate) 74.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Note	Message Alert	C110	Communication (UC)	Attend to Sound A-4.2	Decode Message C-5.3			2	
Set	Transmitter Selector Switch	C145	Communication (UC)	Visually Check Switch Position and Monitor Placement of Switch V-4	Evaluate Position Options and Decide Desired Position C-4.6	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	1	
Transmit	Acknowledgment	C002	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	3	
Copy	Coordinates	C042	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3	Write Information P-6.5		12	
Transmit	Acknowledgment	C002	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	3	
Check	Coordinates	C041	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols and Make Judgment (Location Correct) C-6.8	Handle Maps P-4.6		10	
Check	Route	C135	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols and Make Judgment (Best Route) C-6.8	Handle Maps P-4.6		40	

FUNCTION 17 Monitor Audio **TOTAL TIME (Approximate) Continuous***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Monitor	Audio	B029	Communication/ Survivability (UC/US)	Register Sound A-1	Recognize Auditory Signal C-1				(c)

*The total time for this function varies with the segment in which the function occurs.

FUNCTION 18 Monitor Threat (Pilot) **TOTAL TIME (Approximate) 3.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Direction Display	B050	Survivability (US)	Detect Visual Image V-1	Recognize Visual Signal (Threat Present) C-3.7			3	
Monitor	Flight Controls	P154	Flight Control (FC)	Make Conditioned Association K-1	Make Conditioned Association C-1	Control Pressure P-2.6			(c)

FUNCTION 19 Perform After Landing Check **TOTAL TIME (Approximate) 8 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Neutralize	Flight Controls	P068	Flight Control (FC)	Feel Control Movements K-4	Make Conditioned Association (Controls Neutralized) C-1.2	Control Pressure P-2.6		5	
Set	AFCS SEL Switch	C007	Flight Control (FC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position and Verify Correct Status C-1.2	Turn Switch P-5.8	Rotary - 5 Positions (R-5)	2	
Set	Swivel Switch	C137	Gear (FG)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position and Verify Correct Status C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	Master Switch (Transponder)	C106	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position and Verify Correct Status C-1.2	Turn Switch P-5.8	Rotary - 4 Positions (R-4)	2	
Check	Cyclic Trim Indicator	C047	Flight Control (FC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position and Verify Correct Status (GND) C-1.2			1	

FUNCTION 20 Perform Before Hover Check

TOTAL TIME (Approximate) 188 Seconds

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Swivel Switch	C137	Gear (FG)	Visually Check Switch Positions and Placement of Switch V-4	Decide Desired Position C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	AFCS SEL Switch	C007	Flight Control (FC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position and Verify Correct Status C-1.2	Turn Switch P-5.8	Rotary - 5 Positions (R-5)	2	
Perform	HIT Check	P087	Flight Control/ Engine Instruments (FC/EIN)	Visually Monitor Instrument Indications V-4	Interpret Sensory and Symbolic Readouts and Make Comparison (*Indication Same as* Performance Charts) C-3.7	Control Pressure P-2.6		180	
Check	Rotor RPM	B134	Engine Instruments (EIN)	Visually Inspect Instrument Indications V-4	Interpret Sensory and Symbolic Readouts and Verify Correct Status (100%) C-3.7			2	

FUNCTION 21 Perform Before Landing Check **TOTAL TIME (Approximate) 39 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Rotor RPM	B134	Engine Instruments (EIN)	Visually Inspect Instrument Indications V-4	Interpret Sensory and Symbolic Readouts and Verify Correct Status (100%) C-3.7			2	
Check	Engine Instruments	B064	Engine Instruments (EIN)	Visually Inspect Instrument Indications V-4	Interpret Sensory and Symbolic Readouts and Verify Correct Status (Readouts Within Limits) C-3.7			5	
Check	Fuel Quantity Indicator	B076	Fuel (EF)	Visually Inspect Instrument Indications V-4	Interpret Symbolic Readout (Quantity) and Make Judgment (Enough Fuel) C-6.8			3	
Check	Master CAUTION/WARNING Panel	B105	Advisory (UAD)	Visually Scan and Register ghts 1	Verify Correct Status (All Lights Extinguished) C-1.2			1	
Check	Radios	C127	Communication (UC)	Visually Scan Dial Indications V-7	Interpret Symbolic Readouts and Verify Correct C-5.3			2	
Check	Park Brake	C118	Brakes (FB)	Visually Inspect Handle Position V-4	Verify Current Position Correct (Unlocked) C-2			7	
Set	Countermeasure Switch	C043	Survivability (US)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (Off) and Verify Correct Status (Light Extinguished) C-1.2	Move Switch P-2.2	Toggle - 2 Positions (T-2)	1	
Set	Flare Dispenser Switch	C067	Survivability (US)	Visually Check Switch Positions, Placement of Switch, and Light V-4	Decide Correct Position (SAFE) and Verify Correct Status (Light Extinguished) C-1.2	Move Switch P-2.2	Safety Toggle - 2 Positions (ST-2)	1	

FUNCTION 21 Perform Before Landing Check [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	AFCS HDG Switch	C006	Flight Control (FC)	Visually Check Switch Positions, Placement of Switch, and Light V-4	Decide Correct Position (Disengaged) and Verify Correct Status (Light Extinguished) C-1.2	Press Switch P-2.2	Springloaded Press (SP)	1	
Set	AFCS ALT Switch	C003	Flight Control (FC)	Visually Check Switch Positions, Placement of Switch, and Light V-4	Decide Correct Position (Disengaged) and Verify Correct Status (Light Extinguished) C-1.2	Press Switch P-2.2	Springloaded Press (SP)	1	
Check	Cyclic Trim Switch	C048	Flight Control (FC)	Visually Inspect Switch Position V-4	Verify Correct Status (AUTO) C-1.2			1	
Check	Swivel Switch	C136	Gear (FG)	Visually Inspect Switch Position V-4	Verify Correct Status (LOCK) C-1.2			1	
Check	Crew	C046	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2		3	
Receive	Communication (Crewchief)	B037	Communication (UC)	Receive Auditory Message A-4.9	Decode Message (Crew Secure) C-5.3			3	

FUNCTION 22 Perform Before Landing Check (LZ) **TOTAL TIME (Approximate) 26 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Rotor RPM	B134	Engine Instruments (EIN)	Visually Inspect Instrument Indications V-4	Interpret Sensory and Symbolic Readouts and Verify Correct Status (100%) C-3.7			2	
Check	Engine Instruments	B064	Engine Instruments (EIN)	Visually Inspect Instrument Indications V-4	Interpret Sensory and Symbolic Readouts and Verify Correct Status (Readouts Within Limits) C-3.7			5	
Check	Fuel Quantity Indicator	B076	Fuel (EF)	Visually Inspect Instrument Indications V-4	Interpret Symbolic Readout (Quantity) and Make Judgment (Enough Fuel) C-6.8	Move Head P-2.6		3	
Check	Master CAUTION/WARNING Panel	B105	Advisory (UAD)	Visually Scan and Register Lights V-1	Verify Correct Status (All Lights Extinguished) C-1.2			1	
Check	Radios	C127	Communication (UC)	Visually Scan Dial Indications V-7	Interpret Symbolic Readouts and Verify Correct C-5.3			2	
Check	Park Brake	C118	Brakes (FB)	Visually Inspect Handle Position V-4	Verify Current Position Correct (Unlocked) C-2			7	
Set	Countermeasure Switch	C043	Survivability (US)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (Off) and Verify Correct Status (Light Extinguished) C-1.2	Move Switch P-2.2	Toggle - 2 Positions (T-2)	1	
Set	Flare Dispenser Switch	C067	Survivability (US)	Visually Check Switch Positions, Placement of Switch, and Light V-4	Decide Correct Position (SAFE) and Verify Correct Status (Light Extinguished) C-1.2	Move Switch P-2.2	Safety Toggle - 2 Positions (ST-2)	1	

FUNCTION 22 Perform Before Landing Check (LZ) [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	AFCS HDG Switch	C006	Flight Control (FC)	Visually Check Switch Positions, Placement of Switch, and Light V-4	Decide Correct Position (Disengaged) and Verify Correct Status (Light Extinguished) C-1.2	Press Switch P-2.2	Springloaded Press (SP)	1	
Set	AFCS ALT Switch	C003	Flight Control (FC)	Visually Check Switch Positions, Placement of Switch, and Light V-4	Decide Correct Position (Disengaged) and Verify Correct Status (Light Extinguished) C-1.2	Press Switch P-2.2	Springloaded Press (SP)	1	
Check	Cyclic Trim Switch	C048	Flight Control (FC)	Visually Inspect Switch Position V-4	Verify Correct Status (AUTO) C-1.2			1	
Check	Swivel Switch	C136	Gear (FG)	Visually Inspect Switch Position V-4	Verify Correct Status (LOCK) C-1.2			1	
Check	Load Secure	C093	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2		3	
Receive	Communication (Crewchief)	B037	Communication (UC)	Receive Auditory Message A-4.9	Decode Message (Load Secure) C-5.3			3	

FUNCTION 23 Perform Before Takeoff Check **TOTAL TIME (Approximate) 35.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Engine Instruments	B064	Engine Instruments (EIN)	Visually Inspect Instrument Indications V-4	Interpret Sensory and Symbolic Readouts and Verify Correct Status (Readouts Within Limits) C-3.7			5	
Check	Fuel Quantity Indicator	B076	Fuel (EF)	Visually Inspect Instrument Indication V-4	Interpret Symbolic Readout (Quantity) and Make Judgment (Enough Fuel) C-6.8			3	
Check	Master CAUTION/WARNING Panel	B105	Advisory (UAD)	Visually Scan and Register Lights V-1	Verify Correct Status (All Lights Extinguished) C-1.2			1	
Set	Park Brake	C120	Brakes (FB)	Feel Brake Position/ Visually Inspect Handle Position K-1/V-4	Verify Current Position Correct (Unlocked) C-2	Push Toe Brakes P-2.2	Push-Pull Handle (PPH)	2	
Set	AFCS SEL Switch	C007	Flight Control (FC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position and Verify Correct Status (Both) C-1.2	Turn Switch P-5.8	Rotary - 5 Positions (R-5)	2	
Set	Cyclic Trim Switch	C048	Flight Control (FC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position and Verify Correct Status (AUTO) C-1.2	Move Switch P-2.2	Toggle - 2 Positions (T-2)	1	
Set	Swivel Switch	C137	Gear (FG)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position and Verify Correct Status (LOCK) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	Master Switch (Transponder)	C106	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Verify Current Position Correct (NORM) C-1.2	Turn Switch P-5.8	Rotary - 4 Positions R-4	2	

FUNCTION 23 Perform Before Takeoff Check [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Countermeasure Switch	C043	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 2 Positions (T-2)	1	
Set	Flare Dispenser Switch	C067	Survivability (US)	Visually Check Switch Position, Placement of Switch, and Light V-4	Decide Correct Position (ARM) and Verify Correct Status (Light Illuminated) C-1.2	Move Switch P-2.2	Toggle - 2 Positions (T-2)	1	
Check	Crew	C046	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2		3	
Receive	Communication (Crewchief)	B037	Communication (UC)	Receive Auditory Message A-4.9	Decode Message (Crew Secure) C-5.3			3	
Check	Radios	C127	Communication (UC)	Visually Scan Dial Indications V-7	Interpret Symbolic Readouts and Verify Correct C-5.3			2	

FUNCTION 24 Perform Before Taxi Check **TOTAL TIME (Approximate) 23.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Swivel Switch	C137	Gear (FG)	Visually Check Switch Positions and Placement of Switch V-4	Decide Desired Position C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	AFCS SEL Switch	C007	Flight Control (FC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Desired Position C-1.2	Turn Switch P-5.8	Rotary - 5 Positions (R-5)	2	
Check	Cyclic Trim Indicator	C047	Flight Control (FC)	Visually Check Indicator's Position V-4	Verify Correct Position (GND) C-1.2			1	
Transmit	Communication (Crewchief)	B038	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message (Ramp/ Door Check) C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	3	
Receive	Communication (Crewchief)	B037	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	
Check	Crew	C046	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message (Crew Secure) C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	3	
Receive	Communication (Crewchief)	B037	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	
Release	Park Brake	C119	Brakes (FB)	Feel Brake Position K-1	Decide and Verify Correct Position (Unlocked) C-1.2	Push Toe Brakes P-2.2		1	
Check	Park Brake Light	C122	Advisory (UAD)	Visually Register Light V-1	Verify Correct Status (Extinguished) C-1.2			1	

FUNCTION 25 Perform Cockpit Communication (Copilot) **TOTAL TIME (Approximate) 7 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS)	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR		DISCRETE	CONTINUOUS
Transmit	Communication (Copilot)	C036	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2	Springloaded Press - 2 Positions (SP-2)	3	
Receive	Communication (Pilot)	P039	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	
Transmit	Communication (Pilot)	P040	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Pull Trigger and Speak P-2.2	Springloaded Trigger (SPTR)	3	
Receive	Communication (Copilot)	C035	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	

FUNCTION 26 Perform Cockpit Communication (Pilot) **TOTAL TIME (Approximate) 7 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Transmit	Communication (Pilot)	P040	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	3	
Receive	Communication (Copilot)	C035	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	
Transmit	Communication (Copilot)	C036	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	3	
Receive	Communication (Pilot)	P039	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	

FUNCTION 27 Perform External Communication **TOTAL TIME (Approximate) 13 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Transmitter Selector Switch	C145	Communication (UC)	Visually Check Switch Positions and Placement of Switch V-4	Evaluate Position Options and Decide Desired Position C-4.6	Turn Switch P-5.8	Rotary - 6 Positions (R-6)	1	
Transmit	Message (Brief)	C109	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	3	
Receive	Message	C107	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			5	
Transmit	Acknowledgment	C002	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	2	

FUNCTION 28 Perform External Communication (Threat) **TOTAL TIME (Approximate) 31 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Transmitter Selector Switch	C145	Communication (UC)	Visually Check Switch Positions and Placement of Switch V-4	Evaluate Position Options and Decide Desired Position C-4.6	Turn Switch P-5.8	Rotary - 6 Positions (R-6)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DEST TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Transmit	Message (Brief)	C109	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	3	
Receive	Acknowledgment	C001	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			2	
Transmit	Message	C108	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message C-5.3	Press Switch and Speak P-2.2	Springloaded Toggle - 3 Positions (SPT-3)	10	
Receive	Acknowledgment	C001	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			2	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DIST/BRG/TIME) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	

FUNCTION 29 Perform Hover

TOTAL TIME (Approximate) 30 Seconds*

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Altitude	P019	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Attitude	P026	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Heading	P081	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Drift	P062	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Maintain	Obstacle Clearance	P115	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Orient Aircraft K-4/V-3.7	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Check	Obstacle Clearance	C114	External Visual Field (VEX)	Visually Register Obstacles V-1	Make Conditioned Association (Aircraft Clear) C-1			1	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 30 Perform Hover Check **TOTAL TIME (Approximate) 42.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Flight Controls (Hover)	P069	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Verify Correct Status (Correct Control Response) C-3.7	Control Pressure P-2.6		10	
Check	Engine Instruments (Hover)	P065	Flight Control/ Engine Instruments (FC/EiN)	Visually Scan Instrument Indications V-7	Inspect Sensory and Symbolic Readouts and Verify Correct Status (Readouts Within Limits) C-3.7	Control Pressure P-2.6		5	
Check	Flight Instruments (Hover)	P071	Flight Control/ Flight Instruments (FC/FI)	Visually Scan Instrument Indications V-7	Inspect Sensory and Symbolic Readouts and Verify Correct Status (Correct Response) C-3.7	Control Pressure P-2.6		10	
Set	AFCS SEL Switch	P007	Flight Control (FC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position and Verify Correct Status C-1.2	Turn Switch P-5.8	Rotary - 5 Positions (R-5)	2*	
Perform	AFCS Check (Hover)	P004	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Verify Correct Status (No Abrupt Engagement Errors) C-3.7	Control Pressure P-2.6		10	
Perform	Power Check (Hover)	P124	Flight Control/ Engine Instruments (FC/EIN)	Visually Check Instrument Indications V-4	Interpret Sensory and Symbolic Readouts (Note Torque and N1) C-3.7	Control Pressure P-2.6		5	

*Time not included in total. The copilot will perform the task while the pilot performs other tasks.

FUNCTION 31 Perform Hover Check [NVG] **TOTAL TIME (Approximate) 42.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Flight Controls (Hover) [NVG]	P070	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Verify Correct Status (Correct Control Response) C-3.7	Control Pressure P-2.6		10	
Check	Engine Instruments (Hover)	P065	Flight Control/ Engine Instruments (FC/EIN)	Visually Scan Instrument Indications V-7	Inspect Sensory and Symbolic Readouts and Verify Correct Status (Readouts Within Limits) C-3.7	Control Pressure P-2.6		5	
Check	Flight Instruments (Hover)	P071	Flight Control/ Flight Instruments (FC/FI)	Visually Scan Instrument Indications V-7	Inspect Sensory and Symbolic Readouts and Verify Correct Status (Correct Response) C-3.7	Control Pressure P-2.6		10	
Set	AFCS SEL Switch	P007	Flight Control (FC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position and Verify Correct Status C-1.2	Turn Switch P-5.8	Rotary - 5 Positions (R-5)	2*	
Perform	AFCS Check (Hover) [NVG]	P005	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Verify Correct Status (No Abrupt Engagement Errors) C-3.7	Control Pressure P-2.6		10	
Perform	Power Check (Hover)	P124	Flight Control/ Engine Instruments (FC/EIN)	Visually Check Instrument Indications V-4	Interpret Sensory and Symbolic Readouts (Note Torque and N1) C-3.7	Control Pressure P-2.6		5	

*Time not included in total. The copilot will perform the task while the pilot performs other tasks.

FUNCTION 32 Perform Hover [NVG] **TOTAL TIME (Approximate) 120 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Altitude (NVG)	P023	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Attitude [NVG]	P028	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Heading [NVG]	P086	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Drift [NVG]	P063	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Maintain	Obstacle Clearance [NVG]	P117	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Orient Aircraft K-4/G-5	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Check	Obstacle Clearance [NVG]	C116	Night Vision Goggles (VG)	Visually Register Obstacles G-1	Make Conditioned Association (Aircraft Clear) C-1			3	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 33 Perform Navigation **TOTAL TIME (Approximate) Continuous***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Monitor	Doppler Display	C054	Navigation Display (ND)	Read Symbolic Display V-5.9	Interpret Symbolic Readout and Make Judgment (Location Correct) C-6.8			4	
Read	Maps	C104	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols C-6.8	Handle Maps P-4.6		10	
Follow	Course	C044	External Visual Field (VEX)	Visually Search External Field of View V-7	Interpret Sensory Feedback and Make Judgment (Adjustment Needed) C-6.8			4	

*The total time for this function varies with the segment in which the function occurs.

FUNCTION 34 Perform Navigation [NVG] **TOTAL TIME (Approximate) Continuous***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Monitor	Doppler Display	C054	Navigation Display (ND)	Read Symbolic Display V-5.9	Interpret Symbolic Readout and Make Judgment (Location Correct) C-6.8			4	
Read	Maps	C104	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols C-5.3	Handle Maps P-4.6		10	
Follow	Course [NVG]	C045	Night Vision Goggles (VG)	Visually Search External Field of View G-7	Interpret Sensory Feedback and Make Judgment (Adjustment Needed) C-6.8			4	

*The total time for this function varies with the segment in which the function occurs.

FUNCTION 35 Perform Taxi **TOTAL TIME (Approximate) 120.5 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Forward Motion (Taxi)	P073	Brakes/ External Visual Field (FB/VEX)	Feel Pedal Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Press Toe Brakes P-2.6		.5	
Control	Heading (Taxi)	P082	Gear/ External Visual Field (FG/VEX)	Feel Swivel Knob Movements/Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6	Springloaded Rotary (SPR)	.5	
Maintain	Obstacle Clearance	P115	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Orient Aircraft K-4/V-3.7	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Check	Obstacle Clearance	C114	External Visual Field (VEX)	Visually Register Obstacles V-1	Make Conditioned Association (Aircraft Clear) C-1			1	

*Since the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 36 Perform Taxi [NVG] **TOTAL TIME (Approximate) 180.5 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Forward Motion (Taxi) [NVG]	P074	Brakes/Night Vision Goggles (FB/VG)	Feel Pedal Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Press Toe Brakes P-2.6		.5	
Control	Heading (Taxi) [NVG]	P083	Gear/Night Vision Goggles (FG/VG)	Feel Swivel Knob Movements/Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6	Springloaded Rotary (SPR)	.5	
Maintain	Obstacle Clearance [NVG]	P117	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Orient Aircraft K-4/G-5	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Check	Obstacle Clearance [NVG]	C116	Night Vision Goggles (VG)	Visually Register Obstacles G-1	Make Conditioned Association (Aircraft Clear) C-1			3	

*Since the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 37 Perform Taxiing Check

TOTAL TIME (Approximate) 21.5 Seconds

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Brakes (Pilot)	P031	Brakes (FB)	Feel Brake Position K-1	Verify Correct Status C-1.2	Press Toe Brakes P-2.2		5	
Check	Brakes (Copilot)	C030	Brakes (FB)	Feel Brake Position K-1	Verify Correct Status C-1.2	Press Toe Brakes P-2.2		5	
Check	Power Steering	C125	Gear (FG)	Feel Knob Movement K-1	Verify Correct Status C-1.2	Control Pressure P-2.6	Springloaded Rotary (SPR)	10	

FUNCTION 38 Program Doppler **TOTAL TIME (Approximate) 389.5 Seconds**

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Doppler Mode Switch	C058	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (Lamp Test) C-1.2	Turn Switch P-5.8	Safety Rotary - 6 Positions (SR-6)	1	
Check	Doppler Panel Lights	C059	Navigation Control (NC)	Visually Register Lights V-1	Verify Correct Status (All Lights Illuminated) C-1.2			2	
Check	Doppler Dim Switch	C052	Navigation Control (NC)	Visually Register Lights V-1	Verify Correct Status C-1.2	Turn Switch P-5.8	Rotary Rheostat (R-R)	5	
Set	Doppler Mode Switch	C058	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Evaluate Position Options and Decide Correct Position (Test) C-3.7	Turn Switch P-5.8	Safety Rotary - 6 Positions (SR-6)	1	
Check	Doppler Display	C053	Navigation Control (NC)	Read Symbolic Display V-5.9	Interpret Symbolic Readout and Verify No Malfunctions C-3.7			18	
Set	Doppler Mode Switch	C058	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (UTM) C-1.2	Turn Switch P-5.8	Safety Rotary - 6 Positions (SR-6)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (SPH/VAR) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (H) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	Doppler Spheroid Data	C060	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Spheroid Data) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	10	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Right Display Blank) C-1 2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	Doppler Magnetic Variat on	C057	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Magnetic Variation) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	10	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (TGT STR Data) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (H) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Center Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	Doppler Zone Data	C061	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Zone Data) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	8	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Center Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	UTM Coordinates	C151	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Coordinates) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	12	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (SPH/VAR) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (H) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (1) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (TGT STR Data) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	Doppler Magnetic Variation	C057	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Magnetic Variation) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	10	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (TGT STR Data) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (H) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (1) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Center Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left and Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	UTM Coordinates	C0151	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Coordinates) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	12	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (SPH/VAR) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (1) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (2) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (TGT STR Data) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	Doppler Magnetic Variation	C057	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Magnetic Variation) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	10	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (TGT STR Data) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (1) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (2) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Center Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left and Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	UTM Coordinates	C151	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Coordinates) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	12	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (SPH/VAR) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (2) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (3) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (TGT STR Data) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	Doppler Magnetic Variation	C057	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Magnetic Variation) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	10	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (TGT STR Data) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (2) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (3) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Center Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left and Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	UTM Coordinates	C151	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Coordinates) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	12	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (SPH/VAR) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (3) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (4) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (TGT STR Data) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	Doppler Magnetic Variation	C057	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Magnetic Variation) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions	10	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (TGT STR Data) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (3) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (4) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions	5	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Center Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left and Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	UTM Coordinates	C151	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Coordinates) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	12	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Set	FLY-TO-DEST Switch	C072	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (H) C-1.2	Turn Switch P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DIST/BRG/TIME) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left and Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 38 Program Doppler [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Set	FLY-TO-DEST Switch	C072	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (1) C-1.2	Turn Switch P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	

FUNCTION 39 Program Transponder **TOTAL TIME (Approximate) 85 Seconds**

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Master Switch (Transponder)	C106	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (STBY) C-1.2	Turn Switch P-5.8	Rotary - 4 Positions (R-4)	2	
Set	Mode 1 Code	C111	Survivability (US)	Visually Locate Switch and Read Symbolic Display V-5.9	Encode Current Entry (Current Code) C-5.3	Press Switches P-2.2	Springloaded Press (SP)	5	
Set	Mode 3A Code	C112	Survivability (US)	Visually Locate Switch and Read Symbolic Display V-5.9	Encode Current Entry (Current Code) C-5.3	Press Switches P-2.2	Springloaded Press (SP)	10	
Check	Test Light	C139	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Illuminated) C-1.2	Press Light P-2.2	Springloaded Press (SP)	.5	
Check	Test/MON Light	C140	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Illuminated) C-1.2	Press Light P-2.2	Springloaded Press (SP)	.5	
Check	Reply Light	C133	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Illuminated) C-1.2	Press Light P-2.2	Springloaded Press (SP)	.5	
Set	ANT Switch	C024	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (BOT) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	Master Switch (Transponder)	C106	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (NORM) C-1.2	Turn Switch P-5.8	Rotary - 4 Positions (R-4)	2	
Set	M-1 Test Switch	C097	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	

FUNCTION 39 Program Transponder [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	M-1 Switch	C096	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Evaluate Position Options and Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-2 Test Switch	C099	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	M-2 Switch	C098	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-3 Test Switch	C101	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	M-3 Switch	C100	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-C Test Switch	C103	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	M-C Switch	C102	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	ANT Switch	C024	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (TOP) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-1 Test Switch	C097	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	

FUNCTION 39 Program Transponder [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	M-1 Switch	C096	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-2 Test Switch	C099	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	M-2 Switch	C098	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-3 Test Switch	C101	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	M-3 Switch	C100	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-C Test Switch	C103	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	M-C Switch	C102	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	ANT Switch	C024	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (DIV) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-1 Test Switch	C097	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	

FUNCTION 39 Program Transponder [Continued]

TASKS		TASK #		WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT		SUBSYSTEM(S)	SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	M-1 Switch	C096	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-2 Test Switch	C099	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	M-2 Switch	C098	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-3 Test Switch	C101	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	M-3 Switch	C100	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-C Test Switch	C103	Survivability (US)	Visually Register Light V-1	Verify Correct Status (Go Illuminated) C-1.2	Move and Hold Switch P-2.2	Toggle - 3 Positions (T-3)	2	
Set	M-C Switch	C102	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	Mode 4 Switch	C113	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Desired Position C-1.2	Turn Switch P-2	Rotary - 4 Positions	2	

FUNCTION 39 Program Transponder [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	M-1 Switch	C096	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-2 Switch	C098	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-3 Switch	C100	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	
Set	M-C Switch	C102	Survivability (US)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (ON) C-1.2	Move Switch P-2.2	Toggle - 3 Positions (T-3)	1	

FUNCTION 40 Refuel Aircraft

TOTAL TIME (Approximate) 308 Seconds*

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Park Brake	P120	Brakes (FB)	Visually Inspect Handle Position/Feel Brake Position V-4/K-1	Verify Current Position Correct (Locked) C-2	Push Toe Brakes P-2.6	Push-Pull Handle (PPH)	2	
Set	Park Brake Lever	P121	Brakes (FB)	Visually Locate Handle V-5	Decide and Verify Correct Position (Locked) C-1.2	Pull Handle P-5.8	Push-Pull Handle (PPH)	1	
Check	Fuel Quantity Indicator	B076	Fuel (EF)	Visually Check Instrument Indication V-4	Interpret Symbolic Readout (Quantity) and Make Judgment (Enough Fuel) C-4.6			3	
Check	Refueling Complete	P132	Fuel (EF)	Receive Auditory Message A-4.9	Verify Correct Status C-1.2			3	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 41 Respond to Threat **TOTAL TIME (Approximate) 36 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Detect	Threat	B141	Survivability (US)	Detect Visual Image V-1	Recognize Visual Signal (Threat Present) C-3.7			3	
Press	Flare Dispenser Switch	C066	Survivability (US)	Feel Switch Movement K-2	Verify Correct Position (Flare Activated) C-1.2	Press Switch P-2.2	Springloaded Press (SP)	.5	
Set	Target Storage Switch	C138	Navigation Control (NC)	Visually Locate Switch V-5	Verify Correct Position C-1.2	Press Switch P-2.2	Springloaded Press (SP)	1	
Perform	Hard Turns	P078	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Orient Aircraft K-4/V-3.7	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		3	
Change	Altitude Sharply	P020	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		3	
Change	Airspeed Quickly	P014	Flight Control (FC)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		3	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 42 Respond to Threat [NVG] **TOTAL TIME (Approximate) 46 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Detect	Threat	B141	Survivability (US)	Detect Visual Image V-1	Recognize Visual Signal (Threat Present) C-3.7			3	
Press	Flare Dispenser Switch	C066	Survivability (US)	Feel Switch Movement K-2	Verify Correct Position (Flare Activated) C-1.2	Press Switch P-2.2	Springloaded Press (SP)	.5	
Set	Target Storage Switch	C138	Navigation Control (NC)	Visually Locate Switch V-5	Verify Correct Position C-1.2	Press Switch P-2.2	Springloaded Press (SP)	1	
Perform	Hard Turns [NVG]	P079	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Orient Aircraft K-4/G-5	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		4	
Change	Altitude Sharply [NVG]	P021	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		4	
Change	Airspeed Quickly [NVG]	P015	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		4	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 43 Unload Aircraft (Internal) **TOTAL TIME (Approximate) 21 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Monitor	Unloading	C149	Cargo (UCA)	Visually Scan Cargo Compartment V-7	Verify Correct Procedure C-1.2	Move Head P-2.6		10	
Verify	Unloading Complete	C150	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	
Transmit	Communication (Crewchief)	B038	Communication (UC)	Receive Speech Feedback A-4.3	Encode Message (Ramp/ Door Check) C-5.3	Press Switch and Speak P-2.2		3	
Receive	Communication (Crewchief)	B037	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	

FUNCTION 44 Unload Cargo (External) **TOTAL TIME (Approximate) 9.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Verify	Load on Ground	P091	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	
Press	Cargo Release Button	P034	Cargo (UCA)	Feel Switch Movement K-4	Verify Correct Position (Button Pressed) C-1.2	Press Button P-2.2	Springloaded Press (SP)	1	
Check	Hook Open Light	P088	Cargo (UCA)	Visually Register Light V-1	Verify Correct Status (Illuminated) C-4.6			.5	
Verify	Load Released	P092	Communication (UC)	Receive Auditory Message A-4.9	Decode Message C-5.3			3	

FUNCTION 45 Update Doppler (Landmark) **TOTAL TIME (Approximate) 85.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (P) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Display Frozen) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Read	Maps	C104	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols C-6.8	Handle Maps P-4.6		10	
Enter	UTM Coordinates	C151	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Coordinates) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Function (SP-AN)	12	
Read	Maps	C104	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols C-6.8	Handle Maps P-4.6		10	
Verify	Aircraft Location	C010	External Visual Field (VEX)	Visually Search External Field of View V-7	Interpret Sensory Feedback and Make Judgment (Correct Landmark) C-6.8			40	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 45 Update Doppler (Landmark) [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DIST/BRG/TIME) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	

FUNCTION 46 Update Doppler (Landmark) [NVG] **TOTAL TIME (Approximate) 85.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (P) C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Display Frozen) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Read	Maps	C104	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols C-6.8	Handle Maps P-4.6		10	
Enter	UTM Coordinates	C151	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Coordinates) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Function (SP-AN)	12	
Read	Maps	C104	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols C-6.8	Handle Maps P-4.6		10	
Verify	Aircraft Location [NVG]	C011	Night Vision Goggles (VG)	Visually Search External Field of View G-7	Interpret Sensory Feedback and Make Judgment (Correct Landmark) C-6.8			40	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 46 Update Doppler (Landmark) [NVG] [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DIST/BRG/TIME) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	

FUNCTION 47 Update Doppler (Mission Change) **TOTAL TIME (Approximate) 85 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Doppler Mode Switch	C058	Navigation Control (NC)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (UTM) C-1.2	Turn Switch P-5.8	Safety Rotary - 6 Positions (SR-6)	1	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Center Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	Doppler Zone Data	C061	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Zone Data) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Function (SP-AN)	8	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Left and Right Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	UTM Coordinates	C151	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Coordinates) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Function (SP-AN)	12	

FUNCTION 47 Update Doppler (Mission Change) [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7)	Press Key P-2.2	Springloaded Press (SP)	1	
Set	FLY-TO-DEST Switch	C072	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position C-1.2	Turn Switch P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	DEST DISP Thumbwheel	C049	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position C-1.2	Turn Thumbwheel P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (TGT STR Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Center Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Enter	Doppler Spheroid Data	C060	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Spheroid Data) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	10	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Center Display Blank) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	

FUNCTION 47 Update Doppler (Mission Change) [Continued]

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Enter	Doppler Magnetic Variation	C057	Navigation Control (NC)	Visually Locate Keys and Read Symbolic Display V-5.9	Encode and Verify Correct Entry (Magnetic Variation) C-5.3	Type Entry P-7	Springloaded Press - Alphanumeric Functions (SP-AN)	10	
Check	Doppler Display	C053	Navigation Control (NC)	Read Symbolic Display V-5.9	Interpret Symbolic Readout and Verify No Malfunctions C-3.7			18	
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Position and Placement of Switch V-4	Decide Correct Position (DEST/TGT) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Set	FLY-TO-DEST Switch	C072	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position (H) C-1.2	Turn Switch P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	

FUNCTION 48 Update Doppler (PZ) **TOTAL TIME (Approximate) 8.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Display Frozen) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Set	FLY-TO-DEST Switch	C072	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position C-1.2	Turn Switch P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	

FUNCTION 49 Update Doppler (Stored Destination) **TOTAL TIME (Approximate) 62 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DIST/BRG TIME) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Read	Maps	C104	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols C-6.8	Handle Maps P-4.6		10	
Verify	Aircraft Location	C010	External Visual Field (VEX)	Visually Search External Field of View and Read Map Symbols V-7	Identify Objects and Make Judgment (Location Correct) C-6.8			40	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Display Frozen) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Set	FLY-TO-DEST Switch	C072	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position C-1.2	Turn Switch P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	

FUNCTION 50 Update Doppler (Stored Destination) [NVG] **TOTAL TIME (Approximate) 62 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Set	Doppler Display Selector Switch	C055	Navigation Control (NC)	Visually Check Switch Positions and Placement of Switch V-4	Decide Correct Position (DIST/BRG TIME) C-1.2	Turn Switch P-5.8	Rotary - 7 Positions (R-7)	2	
Read	Maps	C104	Navigation Control (NC)	Read Map Symbols V-5.9	Interpret Map Symbols C-6.8	Handle Maps P-4.6		10	
Verify	Aircraft Location [NVG]	C011	Night Vision Goggles (VG)	Visually Search External Field of View G-7	Identify Objects and Make Judgment (Location Correct) C-6.8			40	
Press	Doppler KYBD Key	C056	Navigation Control (NC)	Visually Locate Key and Inspect Display Status V-5	Verify Correct Status (Display Frozen) C-1.2	Press Key P-2.2	Springloaded Press (SP)	1	
Press	Doppler Data Entry Key	C051	Navigation Control (NC)	Visually Locate Key and Read Symbolic Display V-5.9	Verify Entry Correct (UTM Coordinates) C-3.7	Press Key P-2.2	Springloaded Press (SP)	1	
Set	FLY-TO-DEST Switch	C072	Navigation Control (NC)	Read Symbolic Display V-5.9	Decide and Verify Correct Position C-1.2	Turn Switch P-5.8	Vertical Thumbwheel - 9 Positions (VT-9)	5	

FUNCTION 51 Adjust Approach Parameters **TOTAL TIME (Approximate) 240 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Attitude	P026	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Rate of Descent	P130	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Airspeed	P012	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Heading	P080	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Drift	P062	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 52 Adjust Approach Parameters [NVG] **TOTAL TIME (Approximate) 340 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Attitude [NVG]	P028	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Rate of Descent [NVG]	P131	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Airspeed [NVG]	P016	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Heading [NVG]	P086	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Drift [NVG]	P063	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 53 Adjust Climb Parameters **TOTAL TIME (Approximate) 20 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Attitude	P026	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Rate of Climb	P128	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Airspeed	P012	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Heading	P080	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 54 Adjust Climb Parameters [NVG] **TOTAL TIME (Approximate) 30 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Attitude [NVG]	P028	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Rate of Climb [NVG]	P129	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Airspeed [NVG]	P016	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Heading [NVG]	P086	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 55 **Adjust Level of Flight Parameters** **TOTAL TIME (Approximate)** **30 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Attitude	P026	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Altitude	P019	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Airspeed	P012	Flight Control (FC)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	
Control	Heading	P081	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		.5	

*Since some of the tasks are performed randomly, the total time for the function is greater than the sum of the length of the individual tasks.

FUNCTION 56 Adjust Level of Flight Parameters [NVG] **TOTAL TIME (Approximate) 30 Seconds***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Control	Attitude [NVG]	P028	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Altitude [NVG]	P023	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Airspeed [NVG]	P016	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Control	Heading [NVG]	P086	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	

FUNCTION 57 Check Aircraft Systems (Copilot) **TOTAL TIME (Approximate) 10.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Engine Instruments	B064	Engine Instruments (EIN)	Visually Inspect Instrument Indications V-4	Interpret Sensory and Symbolic Readouts and Verify Correct Status (Readouts Within Limits) C-3.7			5	
Check	Master CAUTION/WARNING Panel	B105	Advisory (UAD)	Visually Inspect and Register Lights V-1	Verify Correct Status (No Lights Illuminated) C-1.2			1	
Check	Fuel Quantity Indicator	B076	Fuel (EF)	Visually Inspect Instrument Indication V-4	Interpret Symbolic Readout (Quantity) and Make Judgment (Enough Fuel) C-4.6			3	

FUNCTION 58 Check Approach Parameters **TOTAL TIME (Approximate) 1 Second***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Vertical Situation Indicator (Inflight)	P152	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	Airspeed Indicator (Inflight)	P013	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	Heading Indicator (Inflight)	P084	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	

*Since the function is performed randomly and only one task is performed each time the function is selected, the total time is less than the sum of the individual tasks.

FUNCTION 59 Check Climb Parameters **TOTAL TIME (Approximate) 1 Second***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Vertical Situation Indicator (Inflight)	P152	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	Airspeed Indicator (Inflight)	P013	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	Heading Indicator (Inflight)	P084	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	

*Since the function is performed randomly and only one task is performed each time the function is selected, the total time is less than the sum of the individual tasks.

FUNCTION 60 Check Flight Parameters **TOTAL TIME (Approximate) 1 second***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Altimeter (Inflight)	P017	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	Airspeed Indicator (Inflight)	P013	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	Heading Indicator (Inflight)	P084	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	Trim Ball (Inflight)	P147	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	

*Since the function is performed randomly and only one task is performed each time the function is selected, the total time is less than the sum of the individual tasks.

FUNCTION 61 Check Fuel Consumption Parameters **TOTAL TIME (Approximate) 11 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Fuel Quantity Indicator	C076	Fuel (EF)	Visually Inspect Instrument Indication V-4	Interpret Symbolic Readout (Quantity) and Make Judgment (Enough Fuel) C-4.6			3	
Note	Time	C142	Fuel (EF)	Visually Check Instrument Indication V-4	Interpret Readout C-3.7	Write Information P-6.5		7	

FUNCTION 62 Check Level of Flight Parameters **TOTAL TIME (Approximate) 1 Second***

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Altimeter (Inflight)	P017	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	Airspeed Indicator (Inflight)	P013	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	
Check	Heading Indicator (Inflight)	P084	Flight Instruments (FI)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	

*Since the function is performed randomly and only one task is performed each time the function is selected, the total time is less than the sum of the individual tasks.

FUNCTION 63 Establish Hover **TOTAL TIME (Approximate) 3 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Adjust	Power	P123	Flight Control/ External Visual Field (FC/VEX)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/V-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		1	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	

FUNCTION 64 Establish Hover [NVG] **TOTAL TIME (Approximate) 4 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Adjust	Power [NVG]	P126	Flight Control/Night Vision Goggles (FC/VG)	Feel Control Movements/ Visually Detect Aircraft Movement K-4/G-1	Make Conditioned Association (Adjustment Needed) C-1	Control Pressure P-2.6		2	
Check	% TRQ Indicator (Inflight)	P153	Engine Instruments (EIN)	Feel Control Movements/ Visually Check Instrument Indications K-4/V-4	Interpret Readout and Verify Correct Status (Readout Within Limits) C-3.7	Control Pressure P-2.6		1	

FUNCTION 65 Monitor Threat (Copilot) **TOTAL TIME (Approximate) 3.5 Seconds**

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Check	Direction Display	B050	Survivability (US)	Detect Visual Image V-1	Recognize Visual Signal (Threat Present) C-3.7			3	

FUNCTION 66 Monitor Flight Controls

TOTAL TIME (Approximate) Continuous*

TASKS		TASK #	SUBSYSTEM(S)	WORKLOAD COMPONENTS			SWITCH DESCRIPTION	DURATION (SECONDS) DISCRETE/ CONTINUOUS	
VERB	OBJECT			SENSORY	COGNITIVE	PSYCHOMOTOR			
Monitor	Flight Controls	154	Flight Control (FC)	Make Conditioned Association K-1	Make Conditioned Association C-1	Control Pressure P-2.6			(c)

*The total time for the function will vary depending on the length of the segment.